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Including the Railroad Gazette and the Railway Age

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GENERAL NEWS SECTION

If every railway passenger would report to a general officer of the road every instance of poor service, neglect or incivility encountered on his journeys, making his letter full, accurate and prompt, our passenger service would be greatly improved. Of course, passengers cannot afford the time and care necessary to do this, and so we must be satisfied to expect only sporadic crops of useful passengers' reports. Very bad service will quite generally come to the railway officers' attention; and very particular people, having leisure, perhaps temporary, in which to write a letter, will report cases not so bad. The superintendent and the G. P. A. ought, of course, to maintain good service without prodding by the passengers, but we cannot tell when that millennium will arrive. We have brought up this topic at this time simply to commend a woman who is strong-minded (in the good sense of that term), and whose

letter we print, for having complained to a railway in a proper and effective manner. She has not given us many details of her story. But the lady's letter is reasonable and forcible, and we fancy that its quality had something to do with its effectiveness. Every complainer should be just as good a diplomat as he can. It is profitable many times to buy or borrow diplomatic ability, if one is not skilled in that art. One should not make his letter so brief as to encourage a clerk to bury it out of sight; and, on the other hand, one should also take care not to bury the passenger agent's clerk in the profusion of one's words. At the same time, a reference to flowers and blue skies may be just the thing to give your letter the individuality necessary to secure for it the best attention.

BAGGAGE receives a good many favors to which it is not entitled. Why should a passenger with a large and heavy trunk pay the carrier no more than does the man with a small suitcase, cared for by himself? Or, granting that the trunk should be carried free, why should the public demand 100 per cent. perfection in the baggage department? That is more than is attained by any department. These queries arise in a consideration of the complaints of numerous passengers who, in returning from their summer vacations, about September 1-5, have to wait a day or more for their trunks. We do not say that all or any queries of this kind should be answered unfavorably to the passenger; but they are worth examination. "In Europe they do these things differently" we are often told; but even in Europe Mr. Roosevelt had to attend a dinner in his traveling clothes because his trunk was delayed. Around Labor Day a large American passenger station has to increase its baggage-handling forces 50 per cent. or more, and it is not strange that mistakes happen, for these added men are inexperienced. One manager admits that misbranding of baggage occurs from this cause. But what can be done? Can the passenger fairly ask that these extra men shall be trained in baggage-room work and kept on call throughout the year? Not, we should say, unless he is willing to pay something for the accommodation. Again, it is to be remembered that baggage work requires not only skill but long experience. At a busy junction the check men must have a thousand obscure routes at their tongue's end, for the passenger going to some distant small town asks him to do in one or two minutes a job that might reasonably demand three or five minutes, and scores of these passengers present themselves at once. Station men—ticket, baggage and freight—are so expert in making the principal combinations of routes and rates that their operations never fail to astonish passengers; and then they turn around and express surprise when the baggageman fails to do equally well in all his work; which would be possible only if baggagemen were geniuses, able to earn as many thousands as they receive hundreds. A large proportion of baggage delays are due to missing trains at junctions. A comprehensive remedy would be to allow longer time between trains for re-checking and to always keep the baggage cars with the passenger cars; but would that be the best way? In a rush-period like that, when three weeks' passengers return home in three days, delays are inevitable, and the problem is to meet these in the simplest way possible. Experienced travelers do it by carrying in their own hands enough clothes to get along without their trunks for at least two days. Is it unreasonable to ask the passenger to do this always or else to send a trunk or two by express a day before? The cost of expressage would be less than the cost of organizing a railway baggage service which could meet all emergencies.

IN short, it is fair—though it is very hard to convince the passenger of the fairness—to ask the public to put up with occasional inconvenience, in consideration of the low price that it pays. The difficulty of getting a passenger to put up with a slight loss on the ground that the system is the most economical for all passengers will always be with us, no doubt. The public is being educated, in a slight degree, in accepting inconvenience for the

sake of economy, by the practice, which is growing on many roads, of running trains with small baggage space. Trains which formerly included a whole car now allot to baggage a half of a smoking car or even a smaller fraction; and suburban trains, with no baggage space at all are very common. The smaller the baggage space, the greater the liability of inconvenience to some one. A considerable sprinkling of passengers send baggage ahead voluntarily. Whether or not the railway can increase the number of these is a question. People whose demands on the carriers seem to be boundless grow no fewer as time passes, and the men who act as the advocates of that class of people are increasing at an alarming rate. The small merchant who suffers an injustice at the hands of a railway—perhaps a really or supposedly burdensome freight rate on the empty boxes that he returns to some factory—has no difficulty at all in getting the whole community to take up his fight. The merchants establish a bureau and the man whom they put at the head of it spends his days and nights in getting things from the railways. With the Interstate Commerce Commission, the state commissions, the railways that are ready to cut a rate to beat a competitor whenever it can be done legally, and the advantages he enjoys from his acquaintance with his former associates, the railway traffic officers, it is a cold day when the "commissioner" cannot get something. Take, for example, the persistent opposition of certain Chicago people to the railways' efforts to reduce trunks to a reasonable size. They seem likely to carry their point by sheer persistency. We do not say that there is no justice in their demand for delay; but whatever the equitable decision is, or ought to be, those railway officers who are trying to adjust questions of this kind on the basis of economy and the general good are likely to find that their method of treatment is too "academic" to be finally acceptable. The outcome is pretty sure to depend not on logic or philosophy, but on which side possesses the greatest powers of patience and persistency.

BOSTON & MAINE.

THE annual report of the Boston & Maine for the last fiscal year appears in changed form, both outwardly and inwardly. Its pages have been amplified to correspond with those of the owning corporation, the New York, New Haven & Hartford, and the operating statements of the two systems are also made more nearly alike. As in the case of the New Haven, the Boston & Maine this year for the first time presents a "combined" set of figures showing income and expense—that is to say, a combination of the parent company and its subsidiaries, the latter eight in number, though for some reason not explained, the important Maine Central is not included. The subsidiaries that are included are not large—indeed only raise, for example, the total operating increase of the main corporation (\$44,815,084) to \$46,624,409. A combined statement for all the New Haven lines, owned or controlled, however, may not have to wait for actual mergers, and in such a showing the magnitude of the whole system may be revealed. It may be noted in this connection, that the gross revenue of the New Haven (combined) of the Boston & Maine (combined) and of the Maine Central, amounts for the past year to \$142,923,175—to which might be added the gross earnings of the Ontario & Western (\$9,295,702) and large earnings of Massachusetts street railway lines which the New Haven through a holding company indirectly controls. Total gross revenue of all the properties is probably not less than \$155,000,000.

Coming back to the Boston & Maine, it is a unique property. It has an operated mileage of 2,290 miles and a single track mileage of 4,201. On this, its stock capital is low, being but \$48,515,756, as shown by the general balance sheet, including new stock premiums; and its own mortgage, bonded and secured debt is but \$43,849,000, and leased line debt about the same. Its gross earnings are about as large as its capital stock and about as large also as its own bonded debt. But it carries a heavy burden in its leases, with their fixed charges last year

of no less than \$5,385,053. The system is largely made up of leased lines grouped about an original property relatively small. Its accumulated profit and loss surplus is but \$2,284,912. Such a system, as regards its earning power, is peculiarly situated. The small margin called for by the dividend may easily rise to a large percentage for stock; and because it is small it may also be easily swept away.

It was nearly swept away last year for a number of reasons, but, chiefly because of one—the increase in wages. Its gross earnings showed the handsome increase from \$43,357,175 to \$44,815,084, or \$1,457,909, and that in spite of depression in the textile industries of the Merrimac valley and elsewhere. But maintenance of way and structures increased from \$5,253,611 to \$6,066,120; maintenance of equipment from \$5,446,734 to \$6,248,435; and transportation cost rose from \$19,075,788 to \$21,229,175. In this item the pay roll rose from \$18,368,268 to \$20,010,140, and the difference, \$1,641,872, shows one direct increase of wages which itself alone would have been more than 4 per cent. on the normal common stock. The result of the increases named, and minor ones, was the practical extinction of the surplus for dividends, which fell to \$355,988 as compared with \$2,850,621 in 1910. Dividends for the year amounting to \$1,958,971 were, nevertheless, paid, \$1,602,982 of the amount being made up out of net earnings of previous years. The profit and loss surplus of \$3,610,423 in 1910 falls to \$2,284,912, with the increased dividends as the prime factor of the decrease.

Such a negative showing of an old dividend paying line reaches back to remoter causes. When the New Haven took control of the Boston & Maine some two years ago, it found a property, the condition of which may be almost described as archaic. Its rolling stock in actual use illustrated the evolution of equipment through two decades, and many of its cars were historical object lessons for the railway student. On its outlying parts, especially, not much of the big plant was up to date, and complaints of travelers were as vociferous as those of the reformers over the intrusion of the corporation into New Hampshire politics. President Tuttle himself had emphasized the noxious fumes of the Hoosac tunnel, but it was left to President Mellen to eliminate them by the electric service now installed. The system as a whole needed rehabilitation toward higher efficiency very much, as the New Haven itself needed it eight years ago, only more so; and the concrete fact was accented by popular outcry. The president himself has a refined sarcastic reference to the old conditions of the property when, referring to the reduction of the dividend from 6 to 4 per cent., he says: "The road has been operated for several years with such strict economy that there remained but little, if any, margin for further savings."

The rapid progress toward higher efficiency is shown strikingly by the schedule of additions and betterments for the year, which total \$10,993,859, new equipment alone reaching \$6,206,922. Apart from equipment, the five major items are: real estate, \$877,496; electric power transmission, \$640,142; shops, engine houses and turntables, \$368,490; bridges, trestles and culverts, \$358,815; and elimination of grade crossings, \$329,483. How the equipment has been advanced—and incidentally, showing vividly the character of the old equipment—is shown by the addition of 155 steam locomotives and the retirement of 47; addition of 207 passenger, 20 combination, 2 baggage, 1,460 box, 250 refrigerator, 5 coal, 40 flat, 12 caboose, 119 work cars and 41 logging trucks; and, as against these additions, the retirements include 138 passenger, 1,016 freight and 154 work cars. The re-equipment of the system as well as betterments in other directions have obviously been radical. The betterments have been charged \$8,516,737 to capital account, \$2,396,683 to leased lines, and \$85,437 to additional rental of leased roads.

In connection with the increased pay rolls of the year which have played havoc with the surplus from dividends, it is interesting to note that the increase of \$1,641,872 exceeds the increase of \$1,521,513 on the New Haven system during the same year

though the latter system and its force are much larger. This confirms the point raised at the time of the Boston & Maine wage increase that its force had been receiving a lower wage than normal on other lines, and the increase was consequently larger.

Considering the fact that the Boston & Maine is a system that is in the rebuilding, the year's operation and results bring out some interesting features. Its ratio of operating expense to revenue, 72.27 per cent. in 1910, rises to 78.43 per cent. With the new efficiency it will be strange if this large ratio is not materially cut down and, perhaps, ultimately fall toward the New Haven's present ratio of about 65.7 per cent. The company came out well in the matter of taxes, which rose only from \$2,076,880 to \$2,089,905. Hire of equipment shows the considerable rise from \$752,670 to \$848,580—an item that ought to fall low hereafter with the use of the new equipment purchased. The most noteworthy event of the year indicating the cost of rehabilitating the system has been the issue of 106,637 shares of common stock, which at the end of the fiscal year had brought in \$11,077,935. In its stockholdings the company still remains a Massachusetts corporation with 5,319 shareholders in that state owning 368,929 shares, and only 47,863 shares held elsewhere—but in that connection must be remembered the New Haven's majority stock vested in its Boston Holding Company. The balance of the stock—except a small remnant—of the Worcester, Nashua & Rochester line, amounting to 12,689 shares, has been bought, and the old lease practically extinguished. With the merger, that company's stock disappears from the list of stocks and bonds owned, which reduces from \$11,619,463 to \$8,846,626, the most important holdings being 55,514 shares of the Fitchburg, with ledger value of \$5,488,304, and the Maine Central holding of 25,160 shares, with ledger value of \$2,516,000.

This last controlled property, which, whether regarded financially or as a feeder, is a most important asset of the Boston & Maine, paying 8 per cent. on an original investment at par, may fitly have its showing for the fiscal year annexed to that of the controlling corporation. As in the case of its owner, it shows a large decrease in the net applicable to dividends, which fell from \$662,487 in 1910 to \$431,036 in 1911, and its surplus over dividends has been for the latter year but \$32,884. A slight increase in operating revenues of \$145,490 was a good deal more than offset by an increase in operating expenses of \$466,261, of which \$374,989 went to increase in the pay rolls. The property is to undergo extensive refinancing. The capital stock of \$4,995,700 is to be practically doubled by a vote of the stockholders last July, and next year \$5,000,000 more stock will be issued to provide in part for the maturity of the company's consolidated mortgage bonds and notes (together, \$15,484,000) and a new mortgage of \$25,000,000 is to be placed on the property. In connection with these large financial operations appears the significant statement of the president: "It has been decided to reduce the regular dividend rate—now 8 per cent.—to a basis of 6 per cent., by reason of the uncertainty and agitation in regard to financial conditions prevailing throughout the country." The extensive financing, together with expenditures of \$2,397,872 for new equipment and of \$2,867,225 for additions and betterments, outline on the large subsidiary much of the same process of modernizing that marks the Boston & Maine.

The annexed table shows the principal figures for the operation of the Boston & Maine in 1911 as compared with 1910:

| | 1911. | 1910. |
|-----------------------------------|--------------|--------------|
| Mileage operated..... | 2,290 | 2,290 |
| Freight revenue..... | \$25,891,481 | \$25,451,236 |
| Passenger revenue..... | 15,524,431 | 14,655,065 |
| Total operating revenue..... | 44,815,084 | 42,680,707 |
| Maintenance of way and structures | 6,066,120 | 5,253,611 |
| Maintenance of equipment..... | 6,248,435 | 5,446,734 |
| Traffic | 500,350 | 544,016 |
| Transportation | 21,229,175 | 19,075,788 |
| Total operating expenses..... | 35,148,703 | 31,336,324 |
| Taxes | 2,089,905 | 2,076,880 |
| Operating income..... | 7,644,711 | 9,991,230 |
| Gross corporate income..... | 8,506,216 | 10,732,983 |
| Net corporate income..... | 355,988 | 2,850,621 |
| Dividends | 1,958,971 | 1,868,520 |
| Surplus | *1,602,982 | 982,101 |

*Deficit.

NORFOLK & WESTERN AND CHESAPEAKE & OHIO.

WHEN the annual report of the Norfolk & Western for the fiscal year ended June 30, 1911, was made public a few weeks ago, showing a decrease of \$1,300,000 in net corporate income and a surplus of only \$576,000 after the payment of 5 per cent. on the common stock, as compared with a surplus of \$1,117,000 in the year before, there was no particular expression of either surprise or disappointment on the New York Stock Exchange. It is rather interesting, therefore, to note that when the Chesapeake & Ohio report was made public last Saturday there was a distinct expression of disappointment on the floor of the Stock Exchange, because the Chesapeake & Ohio showed a surplus of only \$89,000 after the payment of 5 per cent. dividends on its common stock. Superficially, the difference in the way in which the two reports were received is easily explained. In the first place, the Norfolk & Western has a longer record of larger dividends earned and paid, while the Chesapeake & Ohio only paid 1 per cent. dividends from 1899 to 1909, and then the dividend rate was raised first to 4 per cent. and then to 5 per cent. Moreover, the comparatively small difference between the surplus shown by the Chesapeake & Ohio and that shown by the Norfolk & Western does not correctly show the difference between what was earned net in that year by the two companies. The Chesapeake & Ohio made no charge to income for additions and betterments, while the Norfolk & Western charged \$2,597,000 to income for expenditures which the Interstate Commerce Commission classifies as additions and betterments.

A more detailed comparison of the operation of the two roads, however, appears to indicate that what really happened in 1911 in Chesapeake & Ohio operation was exactly what might have been expected by those familiar with the policy that is being pursued by the present management of the company, and probably the showing made by the road last year is neither a surprise nor a disappointment to them. The present management of the C. & O. bought control of the property after it had been sold to the banking firm of Kuhn, Loeb & Company by the Pennsylvania Railroad. The new management almost at once began a very much more aggressive policy, both from a financial standpoint and from the operating and traffic man's standpoint. Control of the Hocking Valley was bought, and also a half interest in the Kanawha & Michigan, giving the Chesapeake & Ohio its own line to Toledo, and when the old Chicago, Cincinnati & Louisville was sold under foreclosure it was bought in by the Chesapeake & Ohio of Indiana, and the line is now known as the Chicago line of the C. & O., and is operated as part of the main line of the C. & O. This year is the first in which the operations of the Chicago line are included with the C. & O. figures. There has been no such expansion and consequent strain on the Norfolk & Western. Its control by the Pennsylvania and the consequent close traffic relations between the two roads make it unnecessary for the Norfolk & Western to have a line of its own either to the Great Lakes or to Chicago. When, therefore, a year of very much higher operating costs struck both the Norfolk & Western and the Chesapeake & Ohio, the N. & W. could fall back on its reserve, while the C. & O. had little reserve to fall back on. The two companies might be likened to two men, one middle aged, with an accumulation of wealth, and one just beginning a business career. When these two men should come into financial difficulties, the older could draw on his reserve; the younger's reserve really consists in his future. And this is true of the Chesapeake & Ohio; its reserve consists in its potential power to increase its earnings when the benefits of its expansion can be realized.

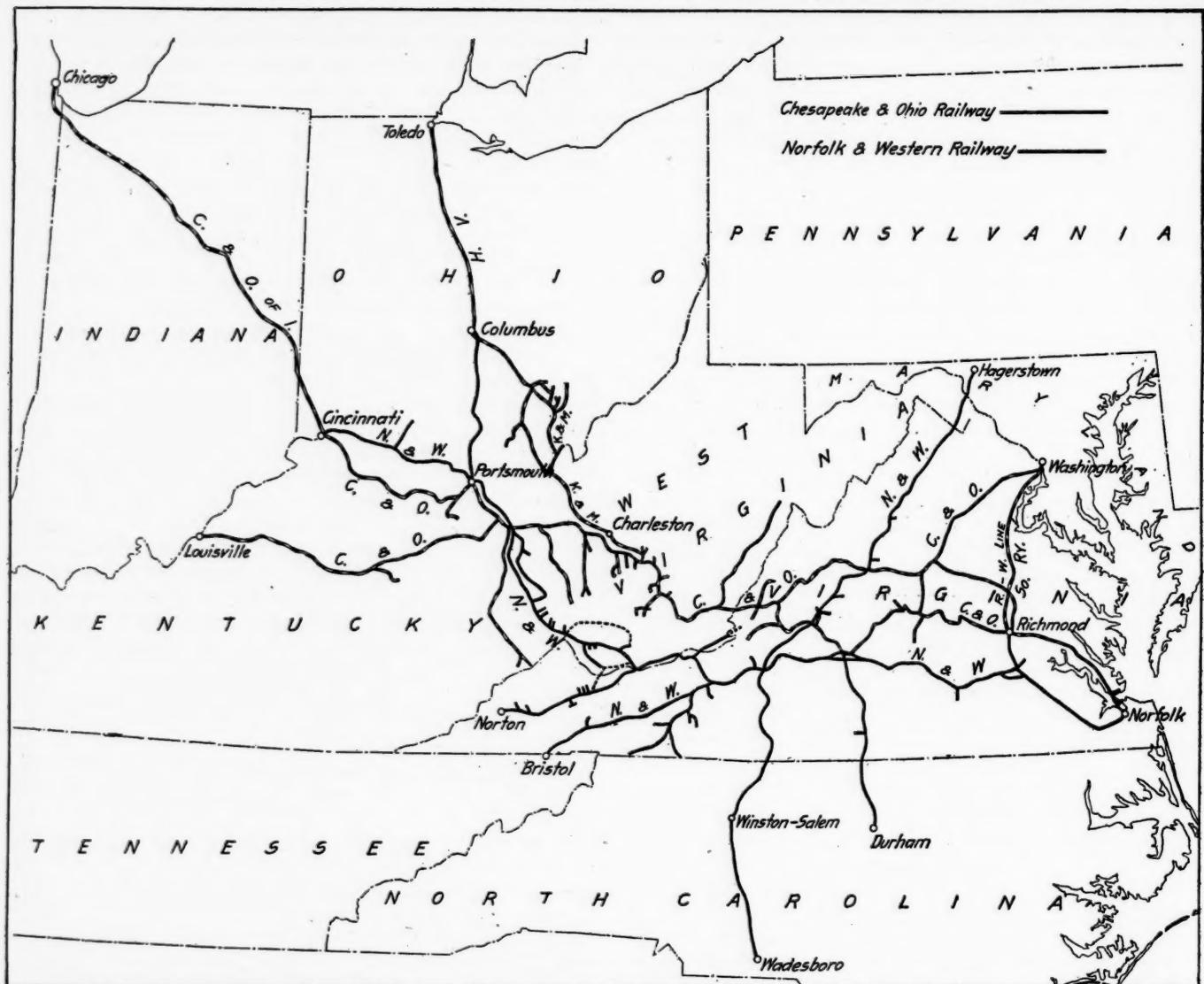
There is hardly another pair of roads in the country that make as good a comparison, from the point of view of plant, business and capitalization, as the Chesapeake & Ohio and the Norfolk & Western. The accompanying map shows how closely parallel the two lines are between the Atlantic seaboard and Cincinnati. The profiles show that the C. & O. has somewhat the best of it as to grades. In 1911 the N. & W. operated an average road

mileage of 1,972 miles; the C. & O., 2,229 miles. In the case of the C. & O., this includes the Chicago line but not, of course, the Hocking Valley, which is operated separately, although shown on our map. Both the Norfolk & Western and the Chesapeake & Ohio are double-tracked the greater part of the way from Tide-water to Cincinnati. Here again, however, the C. & O. has a little the best of it, having 420 miles of second-track, as against 389 for the N. & W. The N. & W., however, has 1,059 miles of sidings; the C. & O., 858. Mention is made in our Railway Construction news columns of the second-track work that is now under way both on the C. & O. and the N. & W.

The Chesapeake & Ohio has \$30,514 of stock outstanding per road mile owned and leased, \$80,741 of bonds outstanding per

\$11,000 per mile is subtracted from the outstanding capitalization of the C. & O., the two roads are capitalized at almost exactly the same amount per mile. With plant and capitalization so nearly alike, it is quite fair to compare the business handled and operating statistics.

In 1911 the revenue from freight traffic on the C. & O. was \$25,590,000,* and from passenger traffic, \$5,513,000; on the N. & W. freight traffic amounted to \$30,115,000, and passenger traffic to \$4,184,000. Care, therefore, must be taken, in comparing operating statistics, to bear in mind that the passenger business on the C. & O. is relatively more important than it is on the N. & W. Last year the Chesapeake & Ohio carried 23,358,000 tons, of revenue freight, an increase of 466,000 tons over 1910;



The Chesapeake & Ohio and Controlled Lines and the Norfolk & Western.

mile, and \$2,872 of equipment trust certificates of the C. & O. Equipment Corporation, which are guaranteed by the parent company and from which corporation the C. & O. rents the rolling stock by which the certificates are secured. It is, therefore, fair to treat their equipment certificates as a capital obligation of the C. & O., and the total securities outstanding per mile of road owned for the Chesapeake & Ohio amounts to \$114,127. The Norfolk & Western has \$48,886 of stock outstanding per mile, and \$45,507 of bonds and equipment trust certificates, a total of \$103,393 per mile. But, as has already been explained, the C. & O. has an investment not only in its property but also in the stock and bonds of the Hocking Valley and the Kanawha & Michigan and other railway companies, and these securities are pledged under its mortgages. They are carried on the 1911 balance sheet at a valuation of \$23,317,000, or about \$11,000 per mile, and if this

while the Norfolk & Western carried 25,828,000 tons, an increase of 416,000 tons over the tonnage carried in 1910. On the C. & O., 15,393,000 tons out of the total was bituminous coal, and on the N. & W., 15,468,000 tons was bituminous coal. In the case of the Chesapeake & Ohio there was an increase of 319,000 tons in bituminous coal, while on the Norfolk & Western there was an increase of 1,482,000. The N. & W. carried a large tonnage of coke also. Last year the tonnage of this commodity was 1,970,000, while the C. & O. carried only 308,000 tons of coke last year. In both cases the tonnage carried in 1911 was very materially less than that carried in 1910. The Norfolk & Western report does not divide the tonnage as between that originating on its own line and that delivered to it by connections,

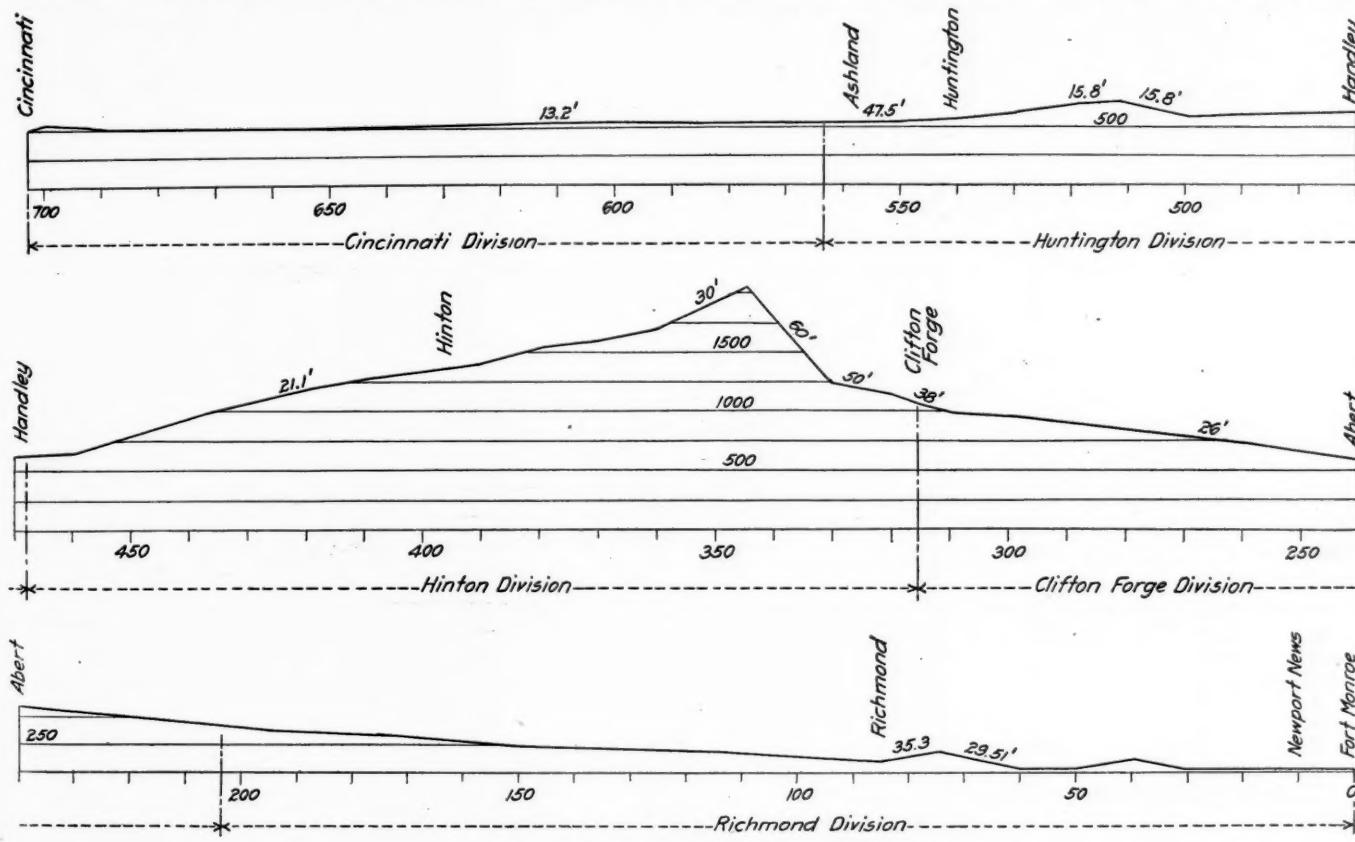
*In all cases where figures are given for the C. & O. for 1911 they include the Chicago line, unless specifically stated otherwise.

but the C. & O. proper, not including the Chicago line, originates 87.67 per cent. of its total tonnage, while the Chicago line originates only 28.08 per cent. of its own traffic. There is, however, quite a large local traffic that is naturally tributary to the Chicago line, and it is the expectation of the management to develop quite a large business for this line from its own territory. The N. & W. divides its traffic as between local and foreign; and, of the 25,828,000 tons carried, 2,183,000 tons was foreign business destined to foreign lines, and 23,645,000 tons was what is called local business, being either from foreign lines to local points, from local points to foreign points, or from one point on the line to another.

It is hardly fair as yet to compare traffic figures for the Chesapeake & Ohio lines, including the Chicago line, with the Norfolk & Western, because of the physical condition of the Chicago line, but comparing the figures for the C. & O. proper with the N. & W. we find that the total number of revenue tons carried one mile was 5,853,000,000, in 1911, a decrease of 4.4 per cent.;

consisted of 6,797,000,000 ton miles and 194,000,000 passenger miles, with 23,323,000 total locomotive miles, an increase of just 1 per cent. over the locomotive mileage of the year before. The Chesapeake & Ohio, including the Chicago line, handled its business, which, including the Chicago line, amounted to 6,083,000,000 ton miles and 253,000,000 passenger miles, with 20,732,000 locomotive miles. Here, apparently, the C. & O. makes a considerably better showing. The C. & O., including the Chicago line, had at the end of the year 780 locomotives, 343 passenger train cars and 42,868 freight and work equipment cars, while the Norfolk & Western had 991 locomotives, 402 passenger train cars and 42,655 freight and work equipment cars. The total tractive power of all locomotives for the C. & O. was 27,197,197 lbs., and for the N. & W., 34,282,399 lbs.

It was increased expenses that cut into the net of both the Norfolk & Western and the Chesapeake & Ohio. The total for each class of expense is given in the tables at the end of these comments, but it is of interest, in comparing the two properties,



Profile of the Main Line of the Chesapeake & Ohio.

while the total ton mileage of the N. & W. was 6,797,000,000, an increase of 1.1 per cent. over the previous year. The average haul on the C. & O. last year was 251 miles, and on the N. & W. 263 miles. The fact is, however, that the C. & O. average haul decreased by 6 per cent., while the N. & W. was shorter by only about one-half of 1 per cent. Freight density on the C. & O. was 3,010,000 tons, and on the N. & W., 3,447,000 tons. The average revenue per ton per mile of all freight was 4.17 mills for the C. & O., and 4.43 mills for the N. & W. The C. & O. gives its coal revenue per ton mile separately; last year the average was 3.22 mills.

The average revenue train load on the C. & O. was 683 tons in 1911, and on the N. & W., 643 tons. In the case of the Chesapeake & Ohio, this train load is revenue tonnage. The Norfolk & Western report does not say whether it includes company freight or is revenue tonnage only. The N. & W. gets an average of 36.44 cars per train, and the C. & O., 37.3. The N. & W. has 22.17 loaded cars in the average train, and the C. & O. has 23.1.

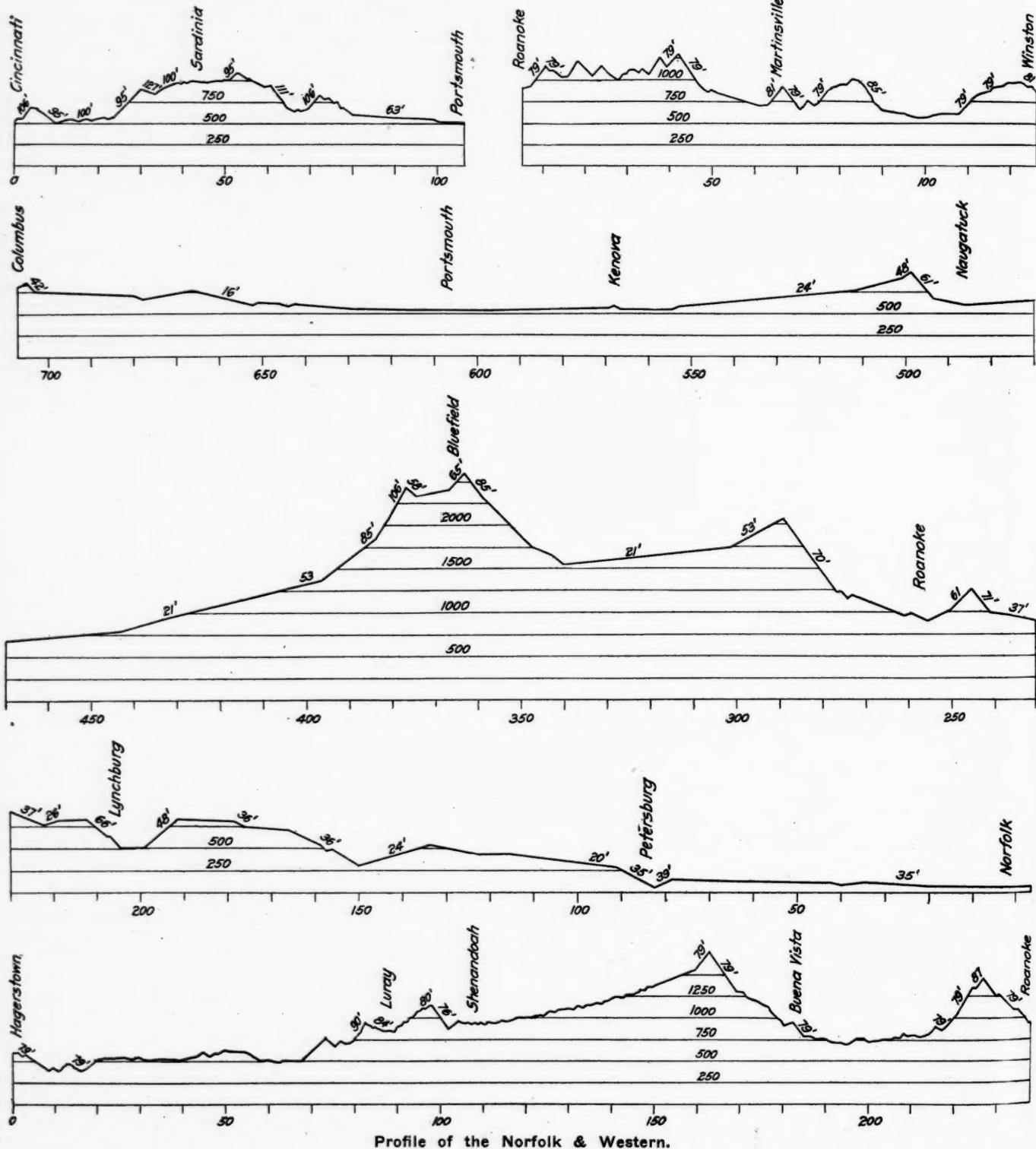
The Norfolk & Western last year handled its business, which

to take certain details of expenditures and compare them on a track mileage basis. The Norfolk & Western last year spent \$26 per track mile for ballast; the C. & O., \$57. The N. & W. spent \$196 per mile for ties; the C. & O., \$186. The N. & W. spent \$113 for rails; the C. & O. only \$49. These are items which show materials bought, and the increased cost of labor does not enter into them to any great extent. In 1911 the C. & O. laid a total of 20,110 tons of new rail, as against 23,629 tons the year before; the N. & W. laid 26,485 tons in 1911, as against 25,086 tons in 1910. The N. & W. does not give the class of rails laid last year, but the C. & O. laid 6,194 tons of 100-lb. rail, something over 9,000 tons of 90-lb. rail, and about 4,400 tons of 85-lb. rail. The Chesapeake & Ohio put 1,087,000 ties in track last year, as against 952,000 the year before; and the Norfolk & Western put 1,191,000 in 1911 and 982,000 in 1910. The C. & O. put a total of 458,000 cu. yds. of ballast under track in 1911 and 562,000 in 1910; the N. & W. put 581,000 cu. yds. under track last year and 418,000 the year before.

Apparently, heretofore the standard weight of rail for the Norfolk & Western has been 85-lb., for, out of the total 1,543

miles of first track, 1,309 was laid with 85-lb. rail. The present standard on the C. & O. is 100-lb. rail, and of the total 1,172 miles of first track of the C. & O. proper, excluding the Chicago line, 461 miles is laid with 100-lb. rail, 126 with 90-lb. rail and 354 with 85-lb. rail. The Chicago line is at present largely laid with 70-lb. rail. From these figures it is evident that the standard of maintenance on both lines is high, and apparently neither the

forces down as well as the N. & W. The expenses for roadway and track, which are largely made up of the cost of placing material in track—in other words, almost entirely labor cost—amounted to \$424 per track mile for the C. & O. in 1911, and to \$411 for the N. & W. The increase over the previous year for the N. & W. was only about 5 per cent., while the increase for the C. & O. was 6 per cent.



Chesapeake & Ohio nor the Norfolk & Western felt that they could afford, even in a year of higher expenses, to lower their standard in any way.

Increased labor cost, however, either bore down on the Chesapeake & Ohio harder than it did on the Norfolk & Western, or else the C. & O. was not able to keep the number of its track

The total cost of transportation on the N. & W. last year was \$10,673,000, an increase of \$603,000 over the previous year; while on the C. & O., transportation cost \$10,044,000, an increase of \$1,535,000. It must be remembered, however, that the figures for 1911 include the Chicago line and do not include this line in 1910.

As to present financial condition: The balance sheet of the

Chesapeake & Ohio shows cash on hand amounting to \$9,371,000, with total working liabilities of \$5,037,000; while the Norfolk & Western has \$5,454,000 cash on hand and total working liabilities of \$3,567,000. The N. & W., however, has no bonds or notes outstanding falling due before 1922, and then only an issue of \$600,000 5 per cent. bonds; while the Chesapeake & Ohio has \$16,000,000 secured gold notes which are due in 1914. Both companies, however, have amply provided themselves with means of financing future needs, the C. & O. having authorized \$125,000,000 first lien and improvement mortgage bonds, maturing 1930, none of which have been issued; and the N. & W. having authorized \$50,000,000 convertible bonds and a corresponding amount of common stock into which these bonds are convertible.

A detailed comparison with the N. & W., when taken in connection with an understanding of the policy of the present management of the C. & O., hardly justified the disappointment apparently shown on the New York Stock Exchange when the C. & O. report was made public, and certainly does not justify any surprise at this showing. The figures for the year show two things clearly: First, that the expected benefits of expansion have not as yet been realized, and any one who knows the condition in which the Chicago line was in when the C. & O. took it would have been surprised if much result had been shown this year. The other is that, despite the present burden that the C. & O. is carrying, the maintenance of the property was fully up to its former standard and appears to be on the whole as high, and in some respects higher, than the Norfolk & Western. It will be recalled that both the N. & W. and the C. & O. had a shorter average haul last year than the year before. The decrease, however, was more notable in the case of the C. & O. than in the N. & W., and it seems probable that this simply indicates that the Chicago line had not been put in shape last year to handle the through traffic that might be expected to be given to it, both destined to Chicago from C. & O. territory and from Chicago to C. & O. territory. Probably a good deal of money will still have to be spent on the Chicago line before it is by any means up to C. & O. standard.

The Hocking Valley, on the other hand, is generally believed to be in first class shape, and as soon as that company's legal difficulties are entirely straightened out, the Chesapeake & Ohio's investment in it should prove of great value to the company.

The following table shows the figures for operation of the Chesapeake & Ohio for 1911, as compared with 1910. In 1911 the figures for the Chicago line are included, but are not included in the 1910 figures.

| | 1911. | 1910. |
|------------------------------------|--------------|--------------|
| Average mileage operated | 2,229 | 1,937 |
| Freight revenue | \$25,590,027 | \$24,901,200 |
| Passenger revenue | 5,512,932 | 5,002,205 |
| Total operating revenue | 32,583,411 | 31,237,169 |
| Maint. of way and structures | 4,141,572 | 3,391,032 |
| Maint. of equipment | 615,338 | 535,208 |
| Transportation | 10,044,173 | 8,509,434 |
| Total operating expenses | 21,793,615 | 18,936,699 |
| Taxes | 1,065,853 | 873,744 |
| Operating income | 9,723,943 | 11,426,726 |
| Gross corporate income | 11,284,757 | 12,588,091 |
| Net corporate income | 3,228,285 | 6,290,586 |
| Dividends | 3,139,625 | 2,668,617 |
| Surplus | 88,600 | 3,621,969 |

The following table shows the figures for operation of the Norfolk & Western for 1911, as compared with 1910:

| | 1911. | 1910. |
|------------------------------------|--------------|--------------|
| Average mileage operated | 1,972 | 1,945 |
| Freight revenue | \$30,115,483 | \$30,037,796 |
| Passenger revenue | 4,184,246 | 3,924,890 |
| Total operating revenue | 35,557,522 | 35,063,870 |
| Maint. of way and structures | 4,328,717 | 3,752,045 |
| Maint. of equipment | 6,638,842 | 5,951,907 |
| Traffic | 586,716 | 551,806 |
| Transportation | 10,672,624 | 10,069,726 |
| Total operating expenses | 22,958,280 | 21,046,760 |
| Taxes | 1,320,000 | 1,118,965 |
| Net operating income | 11,297,242 | 12,898,146 |
| Gross corporate income | 12,581,689 | 14,044,353 |
| Net corporate income | 7,740,379 | 9,043,165 |
| Additions and betterments | 2,597,109 | 3,573,598 |
| *Dividends | 4,560,806 | 4,352,511 |
| Surplus | 576,465 | 1,117,056 |

*Includes \$148,000 in 1911 and \$138,000 in 1910 payment to Pocahontas Coal & Coke Co. on account of deficiency of sinking fund and interest on N. & W.-Pocahontas joint bonds

THE ARROGANCE OF GRAND CHIEF STONE.

THE THERE has come to the *Railway Age Gazette* a copy of an extraordinary and startling communication which was sent on September 2 by Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers, to the heads of the branches of this organization on the Harriman railways and the Illinois Central, and by them transmitted to members of the brotherhood employed on these lines. The text of the communication is as follows:

"Our attention has been called to the pending strike of the federated shop employees on the Harriman Lines, and we have been asked to explain the duties of our members, particularly members holding official positions, should a strike be declared. As you no doubt know, it has always been the policy of this organization to remain neutral during a strike of any other organization. Our members should continue to perform their usual duties, but must not, under any circumstances, take the place or do the work of strikers. We have never understood that it is any part of an official's duty to do work in or about the shops; therefore, members holding official positions cannot do the work or take the place of strikers without violating the laws of the organization. When an engine fails on the line of road it is clearly the duty of the men in charge of it to make such repairs as are necessary to get the engine to the terminal."

The significance of this can be appreciated only by those knowing who are the "officials" referred to. On many roads, including those where the federated shop employees recently struck, the pick of locomotive engineers are promoted to traveling engineers, or, as they are known on some roads, road foremen of engines. Their duty is to instruct locomotive enginemen in their duties, exercise a certain amount of supervision over them, and do all they can to promote locomotive efficiency. They are as truly officers of the railway as the division superintendent or the general manager. They are as much bound to perform all their duties to it that may be assigned to them. Under the unit organization on the Harriman Lines some of them have the title of "assistant superintendent" and, in the absence of assistant superintendents having other matters especially in charge, are the superiors of all operating officers and employees below their rank, including shop employees.

After their promotion as travelling engineers they commonly retain their memberships in the Brotherhood of Locomotive Engineers. As members of the brotherhood, a secret order, they are obliged to obey the instructions of its grand chief and other officials. As officers of the roads they are obligated to obey the orders of all their superiors in the railway service. While their grand chief is instructing them that they "should continue to perform their usual duties, but must not, under any circumstances, take the place or do the work of strikers," their superior officers on the railways must and do require them to do everything they can to help the roads to continue to perform their duty by maintaining public service, even to doing the work of strikers.

No man can serve two masters—not, at least, when they give directly conflicting orders. Therefore, Mr. Stone's communication compels traveling engineers to choose whether they will put first their allegiance to the brotherhood or to the railways. It will be noted Mr. Stone does not say they must either withdraw from the brotherhood or resign from the railways. He implies they are to retain their railway offices and their brotherhood memberships, and take their orders regarding the performance of certain of their duties as railway officers from him. But railway managers cannot long allow any officers of their companies to retain memberships in a secret organization, from whose chief, instructions issue explicitly requiring them to violate their duties as railway officers, or in future risk promoting members of that organization to official positions. If Chief Stone's order stands and the heads of other railway brotherhoods should take a similar position, members of railway brotherhoods must be cut off from all chance of promotion to official positions.

The instructions issued by the Grand Chief of the Brotherhood of Locomotive Engineers were secret. It is fortunate information of them came to railway officers and that the *Railway Age Gazette* is able to make them public. Otherwise railway managers might have found subordinate officers whom they were relying on to help them deal with the strikes working against them; and the public might never have learned of the extent

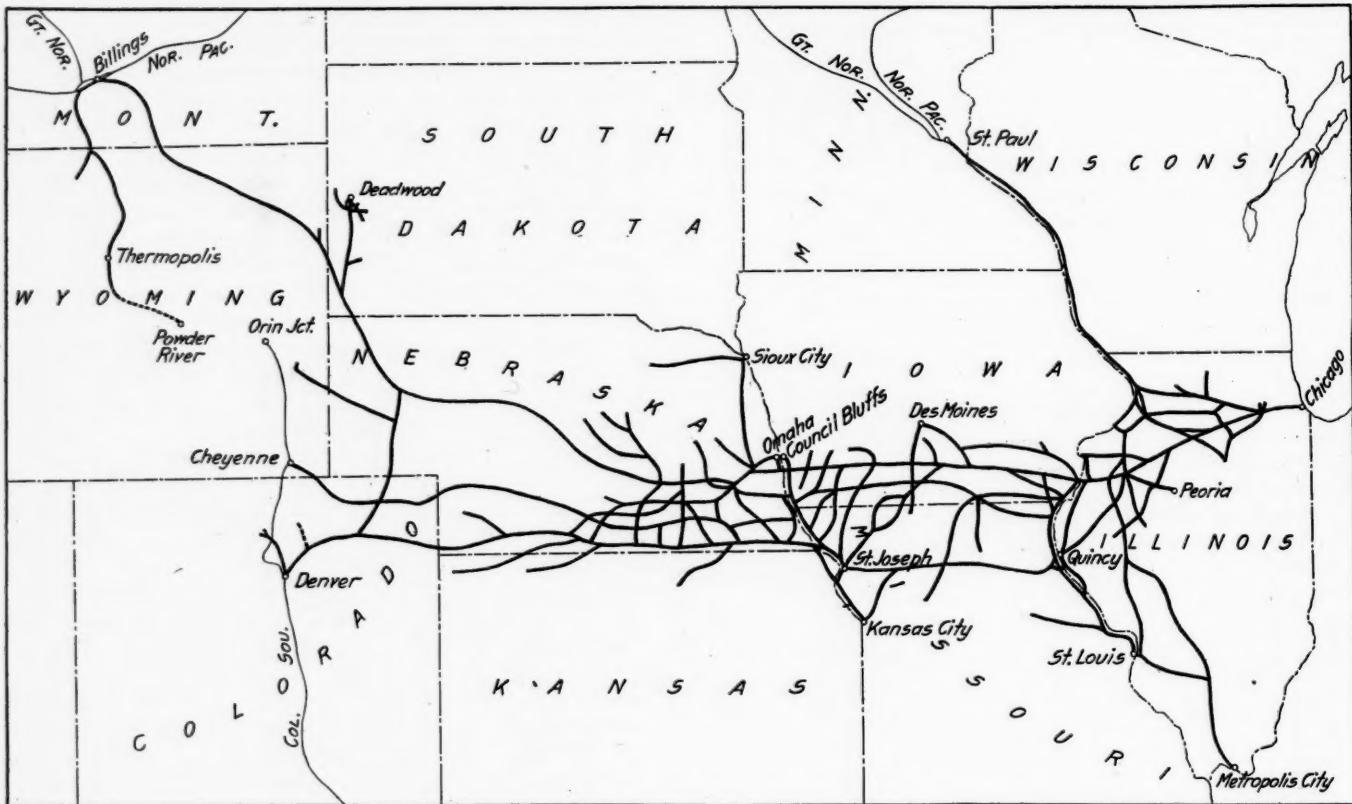
to which the arrogance of the heads of railway brotherhoods, in attempting, without assuming any of the responsibilities, to exercise the authority of railway management, now goes. If Grand Chief Stone's order had bound only members of the brotherhood who are not railway officers, the case would have been different. But it evidently was intended primarily to bind railway officers. Such action by one entirely without responsibility to railway corporations or the public, is intolerable alike to the railways and the public. It illustrates a tendency of railway brotherhoods to try to dominate the entire transportation industry which must be resisted to the last extremity by railway managements and the public for their common protection. The railways have been subjected to detailed regulation. How can the public properly or effectively hold their managers responsible for the way the carriers serve it, if officials of the railways are to receive their orders, not from the railway managers, but from the heads of labor organizations?

CHICAGO, BURLINGTON & QUINCY.

THROUGH economies in the cost of maintenance of way, maintenance of equipment and traffic expenses, and a holding down of transportation expenses, in spite of the increase in

Maintenance of way and structures last year cost but \$12,400,000, as against \$15,730,000 the year before; maintenance of equipment cost \$14,760,000 last year, and \$15,060,000 the year before. The fact that business, both passenger and freight, was less last year than the year before would affect to some extent cost of maintenance of equipment, but it would have only a very slight effect on cost of maintenance of way and structures. On the other hand, the increased wage scale would tend to make these costs, for both equipment and structures, higher, even if no more work were done in 1911 than in 1910. With a road like the Burlington, it is almost inconceivable that maintenance charges would be scaled down to the detriment of the property, and we must conclude, therefore, that the effect of past improvements in both right of way and equipment has put the Burlington in shape to be maintained more economically. This conclusion is strengthened by the fact that large sums have been spent in previous years both for maintenance and for additions and betterments. Since June 30, 1907, \$13,580,000 has been spent for additions and betterments to the property from income alone. In 1911, \$11,030,000 was spent for additions to the property, of which \$4,830,000 was charged to income and the remainder to capital account.

There are no detailed figures for the sums spent for main-



The Chicago, Burlington & Quincy.

wage scale, the Burlington was able to show an operating income of \$25,570,000 in 1911, as compared with \$21,720,000 in 1910. After appropriating \$4,830,000 for betterments and paying the regular 8 per cent. dividends, the company had a surplus of \$3,150,000 for the year, as against \$1,110,000 the year before. This result was obtained in spite of smaller freight revenue and only very slightly larger passenger revenue. The Chicago, Burlington & Quincy Railroad Company is controlled jointly by the Northern Pacific and the Great Northern. Almost the entire stock of the Burlington is deposited to secure collateral trust bonds guaranteed jointly by the Northern Pacific and the Great Northern. The Burlington, therefore, has only two large stockholders. This is the reason, probably, that the annual report of the company is so meagre as to details; the chief interest that can be found in the figures given lies in the light that they throw on the efficiency of operation of the road.

tenance of way, equipment, etc., given in the annual report. Some indications, however, of economies, especially in the cost of conducting transportation, are given by the traffic statistics.

The total number of passengers carried one mile last year was 1,173,000,000, a decrease of 16,000,000 from 1910; the number of tons of freight carried one mile totaled 7,116,000,000 in 1911, a decrease of 319,000,000 from 1910. Freight locomotive miles, however, amounted to 18,340,000 in 1911, a decrease of 2,330,000 miles from 1910. This is a decrease of more than 10 per cent. Passenger locomotive miles totaled 17,700,000 in 1911, and 17,880,000 in 1910. It is very seldom indeed that a road can decrease its passenger locomotive mileage in proportion to a temporary decrease in passenger business. The reasons for this are, of course, obvious. The decrease, however, in the freight locomotive mileage presumably accounts to a considerable extent for the saving in transportation expenses, because, as was pointed out

before, while transportation expenses amounted to \$28,540,000 in 1911 and to \$28,340,000 in 1910, trainmen's wages, etc., were so considerably higher during the whole of 1911 that there must have been actual economies in this department to prevent expenses from running up 6 or 7 per cent. higher than they were the year before.

The Burlington's train load is that of a Hill road. In 1911 the average was 406 tons, an increase of 25 tons over the average in 1910. Although it is not stated in the report whether this is revenue train load or revenue and company freight, the figures are high for a road with the large branch line mileage the Burlington has, and the gain over the previous year is notable. The average number of loaded cars per train was 23.61 in 1911 and 22.44 in 1910; the average number of empty cars was 10.15 last year and 9.28 the year before.

The average haul was 251 miles in 1911 and 267 miles in 1910; and the average receipts per ton per mile were 8.16 mills in 1911 and 7.83 mills in 1910. It is just possible that the Burlington is having a certain amount of through business taken away from it by competitors this year, which would account for the shorter average haul; and some color is lent to this theory by the fact that the Burlington is making especial efforts to establish new through routes for freight. In our comments on the Colorado & Southern's annual report, published last week, mention was made of the new route which the Northern Pacific and the Burlington will have from the Northwest to the Gulf, when the connecting link is built on the Colorado & Southern between its Fort Collins branch and its Wyoming division, and when the Burlington has built a line from Thermopolis, Wyo., to Orin Junction. The Burlington now has in operation a line from Kirby to Thermopolis, and last year \$2,260,000 was spent on the extension from Kirby to Powder River. Track is laid on 14 miles of grade south of Thermopolis and grading almost finished on 82 miles more. Another extension which the Burlington has made which should give it new traffic relations is the line from Herrin, Ill., to Metropolis, on which \$730,000 was spent last year, but which was opened for business on October 15, 1910. Arrangements have now been made by which freight is transferred across the Ohio river to Paducah, Ky., giving the Burlington an outlet into southern territory and putting it in a better position to compete with the Harriman Lines which deliver freight to the Illinois Central, the Illinois Central having a line to Paducah.

The following table compares the operations in 1911 with 1910.

| | 1911. | 1910. |
|------------------------------------|--------------|--------------|
| Average mileage operated | 9,072 | 9,023 |
| Freight revenue | \$58,033,243 | \$58,224,537 |
| Passenger revenue | 22,552,567 | 22,380,306 |
| Total operating revenue | 88,272,208 | 87,869,517 |
| Maint. of way and structures | 12,406,279 | 15,725,461 |
| Maint. of equipment | 14,761,138 | 15,057,165 |
| Traffic | 1,581,805 | 1,654,452 |
| Transportation | 28,543,205 | 28,340,052 |
| Total operating expenses | 59,541,926 | 63,010,965 |
| Taxes | 3,049,124 | 2,970,737 |
| Operating income | 25,574,069 | 21,723,533 |
| Gross operating income | 27,748,768 | 24,247,227 |
| Net corporate income | 16,843,763 | 13,308,746 |
| Appropriated for betterments | 4,826,755 | 3,329,006 |
| Dividends | 8,867,128 | 8,867,128 |
| Surplus | 3,149,880 | 1,112,612 |

NEW BOOKS.

Proceedings of the Western Railway Club for 1910-11. Published by the Western Railway Club. Secretary, J. W. Taylor, 390 Old Colony Bldg., Chicago. Cloth, 6 in. x 9 in., 358 pages.

The work of the Western Railway Club during the past year has been of varied interest, and the value of the papers and discussions compares favorably with that of previous years. The principal papers and discussions relate to automatic connectors for air brakes, signals and steam train pipes; the new Commerce Court; locomotive flue failures; re-working old materials; the standardization of chilled iron wheels; car interchange in the Union Stock Yards district, Chicago; electrification of Chicago railways. There are also included the usual report on the rules of interchange, the secretary's report, list of accessions to the Barnes Library, and a list of the members with their addresses.

Letters to the Editor.

POOR PASSENGER SERVICE AND PUBLIC CO-OPERATION.

October 20, 1911.

To THE EDITOR OF THE RAILWAY AGE GAZETTE:

Reading your editorial note of October 6, concerning the duty of the public to co-operate with railway officers to secure efficiency, it occurs to me that you may be interested in an experience of mine last summer; and I enclose a letter which I wrote to the general passenger agent of the railway on which I had my troubles. No railway officer, nor any one else, can correct faults until they know that such faults exist; and from my experience I believe that railway men generally would be glad to be informed of deficiencies in their service and to remedy those deficiencies, so far as they can.

M.

[The letter to the general passenger agent, referred to above, says that Miss M. and three other ladies began about the middle of June to engage their sleeping car berths and steamboat staterooms, to avoid crowds. They went to the city ticket office and made known their wishes to the young man there. When the interview was nearly finished, he deserted the ladies to talk with a printing contractor (about printed matter to be used a year hence). The ladies became impatient and concluded to go to a rival road, but just then the young man then came back, made the necessary notations and agreed to advise by telephone. After a week, Miss M. called him up and found that he had made the reservations but had not notified her. For the steamboat connection he gave her no tickets, but simply told her to tell the purser the numbers of the staterooms. This arrangement proved to be useless; for on arriving at the boat the ladies had to wait until all the other passengers had been attended to and then, after two hours, secured some staterooms which someone else had given up. On the third stage of the journey, no reservations at all had been made, although the three passengers had honestly thought they had settled the matter in June, three weeks before. Other passengers were found in equally unpleasant situations. One lady of advanced years could secure no bed at all on the boat until another woman, learning of her predicament, shared her berth with the one who was in straits. Other cases are mentioned.

On the return trip, Miss M. had to wait five weeks for one piece of her baggage, finally getting it when, she says, she had convinced the railway people that she would make life miserable for them until she got satisfaction. In the meantime she had to spend \$7.65 to replace some of the missing clothing. These incidents she rehearsed to the general passenger agent, in a detailed and carefully worded letter; she got her money back and received a visit from the general passenger agent. And so she thinks it is proper to give him credit. However, she tells us not to publish his name.

In her letter, Miss M. discusses at some length the movement among railway officers for the promotion of efficiency, as looked at by the public since Mr. Brandeis has exploited that subject; and she tells the G. P. A. that beautifying station grounds and furnishing flowers for the tables in the dining cars cannot always fill the bill. Economy of construction, maintenance and operation is all right, but it is also important to keep the passengers pleasant. "Every one loves flowers, of course, but what good do they do at a railway station if you fear that the conductor will put you off the train if your ticket is wrong; or what satisfaction is there in any amount of beauty if you have to sit up all night because your berth reservation has been incorrectly made? What good are emerald banks rising to skies of Italian blue, or flowers on a dining-car table, if your heart is beating with the fear that, when you go to call for your trunk, it cannot be found?"]

LOCOMOTIVE EFFICIENCY AND CONDITION REPORTS.

BY N. D. BALLANTINE,

Superintendent Car Service, Rock Island Lines.

What is the motive power situation on your road? How many railway managements really know the correct answer to this question? How can they unless an accurate current record is made of the service obtained from their power in such a way, and in sufficient detail, that it may be correlated and intelligently analyzed? Is there any branch of the transportation department more important than that having to do with the proper distribution and use made of the motive power? Are not the roads as a whole deficient in compiling data along this line? There is a need for more information as to the real efficiency being obtained from the motive power; and for comparative purposes as between railways, or as between divisions of a given road, it is desirable to have such data prepared along uniform lines. Most roads are spending considerable money in an endeavor to obtain correct car reports, and a good part of the telegraph facilities are being utilized in obtaining the details and transmitting the summaries to the general and division offices. Is the same proportion of energy and money being spent to secure

Fifth: Lack of uniformity with reference to including engines assigned, or available, thus injecting the bad order feature.

As a general proposition, too many reports are being made, such as they are. They close at various times of the day, have various bases, and are not susceptible of being checked, nor are they checked, for accuracy. If a comprehensive report were required, which closed at midnight and included all the mileage made during the calendar day, accounting for each engine assigned for each hour of the day regardless of whether it was available for service, bad ordered, in engine house, shops, O. K., or white-leaded; and which analyzed the time it was in the hands of the mechanical department and the transportation department—the time it was in the hands of the latter being divided between the periods at terminals and between terminals—such a report would make practicable an intelligent analysis and estimate of the efficiency obtained, and would indicate the remedy for any bad condition that might be disclosed.

Following is an outline of the principal points the average railway management should know about its power; some of the items, however, are variables depending on local conditions, and may be kept separately or included in the miscellaneous column:

Mechanical Department Detention: In shops for heavy re-

| Mechanical Department Telegraph Report of Power Detention (C. T. 107A.) | | | | | | | | | |
|---|-------------|--------------------|--------------------|------------------|-----------------------|-------------------|-------|-------|---------|
| To Chief Disr. <i>Rock Island</i> for 24 Hrs. ending 11:59 p. m. <i>Jan. 1, 1911.</i> | | | | | | | | | |
| At <i>Gates</i> on Locomotives assigned to <i>Ohio</i> Div. | | | | | | | | | |
| WEST OR SOUTHBOUND | | | | | | | | | |
| Class of Service | Eng. Number | On Hand or | | Total Time Held | Analysis of Detention | | | | Ash Pit |
| | | Time Received | Time Released | | Shopped for Reps. | Round House Reps. | | | |
| A | B | F | G | J | M | G | W | AB | |
| Time | 1900 | 12 ⁰¹ A | 10 ¹⁵ P | 10 ¹⁵ | | | 8'45" | 1'30" | |
| <hr/> | | | | | | | | | |
| EAST OR NORTHBOUND | | | | | | | | | |
| GA | GB | GF | GH | GI | GK | GN | GS | GW | |
| <hr/> | <hr/> | <hr/> | <hr/> | <hr/> | <hr/> | <hr/> | <hr/> | <hr/> | |
| Size of Form 8 ¹ / ₂ x 11 ¹ / ₂ inches | | | | | | | | | |
| Round House Foreman. | | | | | Yardmaster or Agent. | | | | |

Mechanical Department Form for Engine Detentions.

prompt and reliable information covering the use of locomotives? I do not think so.

Much of the locomotive data now produced by the average superintendent as to the average miles per day, mechanical and terminal detention, is unreliable and of little or no value for comparative purposes. It is of little use for comparisons, not only between different roads, but between different divisions of the same road. There are a number of reasons for this condition, among which the following are the principal:

First: Failure to check the reports in detail so as to account for each engine assigned to the division during each hour of the twenty-four in a day.

Second: Variations in methods, some roads eliminating from their counts the engines held in engine houses 24 hours or more for repairs, and others allowing for varying engine house detentions.

Third: Failure to close the report at a specified hour enabling a ready means of checking, but instead using the hours and mileage made during a calendar day.

Fourth: Lack of uniformity with reference to including or excluding regularly assigned engines.

pairs; in shops for light repairs; in the engine house; on the ash pit, and the total time held.

Transportation Department Detention: At terminals: to protect the regular trains; to protect the stock rains; to protect fruit, vegetable or meat trains; on account of superior trains interfering; on account of insufficient tonnage; main line obstructions due to wrecks, washouts, etc.; rest for the crews; call time—when the engine is reported ready in less time than is required to allow crews for the call; miscellaneous; total time held at terminals. Between terminals: meeting trains; station work; track conditions; 16-hour law; wrecks, derailments, washouts, etc.; block signals; equipment failures, locomotives; equipment failures, cars; weather conditions; miscellaneous; total time between the terminals.

To show how the above data may be obtained in operation with a minimum amount of labor and expense, the forms to be used are given herewith, together with some of the information to be filled in, and the instructions which are printed on the backs of the forms. The mechanical department report, Form C. T. 107A, is used for information which nearly all roads now gather. It will be noted that telegraphic symbols are put

at the top of the columns, so that when the report is transmitted to the despatcher's office it will be so tabulated that all delays in the hands of the mechanical department, to a given engine, regardless of the point at which it occurs, will be combined and, as far as the engine house foreman can determine, the direction in which the power is next to be used will be shown. Space is also provided for the joint signature of the engine house foreman and the yardmaster, thus providing a check on the time the power is interchanged. This is essential, as the yardmaster has to take up and account for the power at the time the mechanical department releases it, or *vice versa*. If other reports are eliminated this report should not entail any additional work other than that required for more closely checking the time the engine is received and released.

The following are the instructions for the use of Form C. T. 107A:

This report is to be made by the mechanical department and approved as to total time held by a proper representative of the transportation department.

It is to be made in triplicate; the original to be mailed to the chief despatcher of the division and a carbon copy to be sent to the telegraph office for transmission by wire as early as practicable after midnight, unless otherwise instructed.

Engines listed should be arranged in column B in numerical order by

department, as shown on its Form C. T. 107A, column G. The time forwarded should agree with the train register as to the time the engines left the terminals.

Under heading Analysis of Detention show in the proper columns the number of hours and minutes the power is actually held. It is assumed that the chief despatcher will advise the party in charge of the power at the terminals when the engines, after being OK'd, are not ordered on account of various factors shown, so as to enable the report to be properly made up, and put the party in charge of the power in possession of full information concerning its detention.

Under the heading To Protect Regular Schedule the following example will illustrate the manner in which this column should be used: Engine 1900, assigned to a fast freight run, is OK'd at 10:15 a. m., but its schedule provides for leaving at 6 p. m.; then this column would show 3 hours and 55 minutes detention.

In the case of stock, an engine which may be held on account of an uncertain number of cars of stock, or for fruit, vegetable or meat extras, should be shown in the same manner as if being held for regular trains, but under the proper column so that the detention on account of stock can be separated from that due to other classes of traffic. It is not the intention, when fruit, vegetables, meat or stock are handled in regular scheduled trains that they shall be shown as separate items, but only when handled as extras.

If an engine to protect a regular train is held after its regular leaving time in order to protect stock, fruit or meat, this delay should be shown under the proper heading rather than in the column headed Regular Schedule.

In the column headed Superior Trains should be shown detentions which occur by reason of a knowledge on the part of the despatcher that a train permitted to leave at the time the engine is OK'd would not make anything by attempting to get over the road because of having to meet other trains or would be unable to get out of the way of higher class trains following it within a short time.

Column headed Rest for Crews covers cases where engines are assigned

| Yardmaster's Telegraph Report of Power Detention | | | | | | | | | | | | (C. T. 107B.) | |
|---|-------------|--------------------|-------------------|------------------|-----------------------|----|----|-----------------|-------------------|-------------------------------------|----------------|---------------|-------|
| To Chief Disp'r. Rock Island.....for 24 Hrs. ending 11:59 p. m. Jan. 1, 1911. | | | | | | | | | | | | | |
| At Paris.....on Locomotives assigned to Ohio.....Div. | | | | | | | | | | | | | |
| FOR MOVEMENT WEST OR SOUTHBOUND | | | | | | | | | | | | | |
| Class of Svc. | Eng. Number | On Hand or | | Total Hours Held | Analysis of Detention | | | | | | | | |
| | | Time Recd. | Time Ford | | To Protect | | | Superior Trains | Insuffic. Tonnage | M. L. Obstructed Wrecks, W. O., &c. | Rest for Crews | Call Time | Mcls. |
| A | B | AF | AG | AH | AJ | AM | AQ | AU | AX | BA | BF | BI | BJ |
| Time | 1900 | 10 ¹⁵ a | 2 ⁰⁰ p | 3'55" | 3'55" | | | | | | | | |
| EAST OR NORTHBBOUND. | | | | | | | | | | | | | |
| GA | GB | GZ | HA | HB | HF | HT | HK | HN | HS | HW | HZ | JB | JF |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Size of Form 9 x 12 inches. | | | | | | | | | | | | | |
| Yardmaster or Agent. | | | | | | | | | | | | | |

Yardmaster's Report of Engine Detentions.

groups, according to the class of service; namely, local and branch runs, dead freight, and fast freight.

Time received and released by mechanical department should be the time the engines are placed on a designated track agreed on as a delivery point for such engines and when returned to a designated track by the mechanical department.

The sum of the hours shown under heading Analysis of Detention should agree with the figures in the column headed Total Time Held.

The report should be signed and agreed to by representatives of the mechanical and transportation departments.

The yardmaster's report, Form C. T. 107B, accounts for the total time the power is in the yardmaster's possession. The telegraphic symbols at the heads of the columns bring this part of the information into the despatcher's office on the large blank in the proper space opposite to the given engine number and on the same line with the mechanical department data. This is also information which is usually kept, but seldom in such detail; with this form it should not entail much, if any, additional work.

The following are the instructions for the use of Form C. T. 107B:

This report is to be made in triplicate; the original to be mailed to the chief despatcher of the division, and the duplicate to be filed in the telegraph office for transmission by wire as soon after midnight as practicable.

Engines should be arranged in column B in numerical order by groups, according to the class of service; namely, local and branch runs, dead freight and fast freight.

Time received should agree with the time released by the mechanical

to certain crews and although OK'd by the mechanical department cannot be used until the crew has had the required allowance for rest.

Column headed Call Time covers a case where the interval of time between the advice from the mechanical department that the power will be OK'd at a given time is less than the time required to call the crew. For example, at 10 a. m. the mechanical department advised that an engine would be O. K. at 11 a. m., but the crew could not be called before 12 m., thus resulting in the loss of an hour's time.

In the column headed Miscellaneous, show all other items of delay not otherwise accounted for.

The conductor's report, Form C. T. 107C, accounts for the total time the engine is on the road on each trip, or from leaving time until midnight; in the latter case a second report is made covering the remainder of the trip after midnight, thus giving a definite closing time for the report regardless of where the engine may be. As the report closes at midnight, ample time is given for the data to be transmitted by wire, tabulated by the receiving operator and summarized before the superintendent usually reaches his office in the morning. Conductors generally make a report of delays, but instead of sending it in the form of a message, they make it up on a standard form, frequently saving time in telegraphing and putting it in such shape that all delays of similar nature can be tabulated with a minimum amount of labor and their total easily determined. Provision is also made for accounting for loss in efficiency by reason of reductions in tonnage caused by unusual conditions. This infor-

mation, if properly used, may afford a basis for placing a cash equivalent opposite such factors and will readily reflect the bearing they have on the total cost of operation.

Following are the instructions for using Form C. T. 107C:

This report is to be made in triplicate; the original and a carbon copy are to be filed in the telegraph office promptly on arrival at the terminal, or at the first telegraph office reached after midnight, it being understood that when trains are on the road at midnight two reports shall be made for the run, one to cover the time between leaving the terminal and midnight, and another from midnight to the time of arrival at the terminal.

Under the heading Analysis of Delays shall be shown the total delays as they actually occur, whether the train reaches its destination on time or not. The headings are self-explanatory, except, possibly, the column headed Equipment Failures, the intention being to cover under that head, delays due to engine failures or cars with hot boxes, draw bars pulled out, or other similar mechanical defects.

Under the heading Tonnage Set Out Short of Train Terminal Destination, should be shown, in the proper column as to the cause, the total number of tons and the distance such tonnage would have moved had the emergency not arisen, multiplying these two factors together to give the ton-miles lost.

Under the heading Miscellaneous give any other information which is considered of special interest with reference to delays in transit.

Form C. T. 107 is the blank used in the dispatcher's office on which the receiving operator can directly tabulate the data as transmitted by the division offices, or as obtained from the conductor's delay report; it will be noted that in reality this blank, in addition to showing the utility of the motive power, contains a condensed train sheet where all the principal delays to trains can be analyzed either in detail, or as a whole. In the preparation of the blank for the reception of the information it may, of course, be lined up in the way that would be desirable to meet the local requirements—that is, entirely on a numerical order basis, or separated as between local, dead and time freights, with each class of engine arranged numerically.

After the various reports have been received, they should be checked to see that each locomotive is accounted for during each hour of the day, and that the analysis of the various delays corresponds with the total time shown on the various reports. After this the various columns may be added for the totals, which latter are, of course, all that the division superintendent or higher officer should need, unless he desires to analyze in detail some condition which is reflected as needing attention. The same blank may also be used for tabulating the totals by days for each division by classes. For example, if the reports are to be classified as between local, dead and time freights, three sheets will be needed for each division for each month, and by returning the blanks to the telegraph office each night the receiving operator can tabulate at once without extra work or delay. After having a few days' reports recorded, he will be less likely to make errors, because he will have some general figures to guide him.

TABLE FOR CONVERTING LOCOMOTIVE HOURS AND DECIMALS OF HOURS INTO LOCOMOTIVE TRACTIVE EFFORT HOURS (IN THOUSANDS) FOR A LOCOMOTIVE OF 25,000 POUNDS TRACTIVE EFFORT.

| Loco. Hrs. | T. E. Hrs. | Loco. Hrs. | T. E. Hrs. | Loco. Hrs. | T. E. Hrs. | Loco. Hrs. | T. E. Hrs. | Loco. Hrs. | T. E. Hrs. | Loco. Hrs. | T. E. Hrs. |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| ... | 5.0 | 125 | 10.0 | 250 | 15.0 | 375 | 20.0 | 500 | | | |
| .1 | 2.5 | .1 | 127.5 | .1 | 252.5 | .1 | 377.5 | .1 | 502.5 | | |
| .2 | 5 | .2 | 130 | .2 | 255 | .2 | 380 | .2 | 505 | | |
| .3 | 7.5 | .3 | 132.5 | .3 | 257.5 | .3 | 382.5 | .3 | 507.5 | | |
| .4 | 10 | .4 | 135 | .4 | 260 | .4 | 385 | .4 | 510 | | |
| .5 | 12.5 | .5 | 137.5 | .5 | 262.5 | .5 | 387.5 | .5 | 512.5 | | |
| .6 | 15 | .6 | 140 | .6 | 265 | .6 | 390 | .6 | 515 | | |
| .7 | 17.5 | .7 | 142.5 | .7 | 267.5 | .7 | 392.5 | .7 | 517.5 | | |
| .8 | 20 | .8 | 145 | .8 | 270 | .8 | 395 | .8 | 520 | | |
| .9 | 22.5 | .9 | 147.5 | .9 | 272.5 | .9 | 397.5 | .9 | 522.5 | | |
| 1.0 | 25 | 6.0 | 150 | 11.0 | 275 | 16.0 | 400 | 21.0 | 525 | | |
| .1 | 27.5 | .1 | 152.5 | .1 | 277.5 | .1 | 402.5 | .1 | 527.5 | | |
| .2 | 30 | .2 | 155 | .2 | 280 | .2 | 405 | .2 | 530 | | |
| .3 | 32.5 | .3 | 157.5 | .3 | 282.5 | .3 | 407.5 | .3 | 532.5 | | |
| .4 | 35 | .4 | 160 | .4 | 285 | .4 | 410 | .4 | 535 | | |
| .5 | 37.5 | .5 | 162.5 | .5 | 287.5 | .5 | 412.5 | .5 | 537.5 | | |
| .6 | 40 | .6 | 165 | .6 | 290 | .6 | 415 | .6 | 540 | | |
| .7 | 42.5 | .7 | 167.5 | .7 | 292.5 | .7 | 417.5 | .7 | 542.5 | | |
| .8 | 45 | .8 | 170 | .8 | 295 | .8 | 420 | .8 | 545 | | |
| .9 | 47.5 | .9 | 172.5 | .9 | 297.5 | .9 | 422.5 | .9 | 547.5 | | |
| 2.0 | 50 | 7.0 | 175 | 12.0 | 300 | 17.0 | 425 | 22.0 | 550 | | |
| .1 | 52.5 | .1 | 177.5 | .1 | 302.5 | .1 | 427.5 | .1 | 552.5 | | |
| .2 | 55 | .2 | 180 | .2 | 305 | .2 | 430 | .2 | 555 | | |
| .3 | 57.5 | .3 | 182.5 | .3 | 307.5 | .3 | 432.5 | .3 | 557.5 | | |
| .4 | 60 | .4 | 185 | .4 | 310 | .4 | 435 | .4 | 560 | | |
| .5 | 62.5 | .5 | 187.5 | .5 | 312.5 | .5 | 437.5 | .5 | 562.5 | | |
| .6 | 65 | .6 | 190 | .6 | 315 | .6 | 440 | .6 | 565 | | |
| .7 | 67.5 | .7 | 192.5 | .7 | 317.5 | .7 | 442.5 | .7 | 567.5 | | |
| .8 | 70 | .8 | 195 | .8 | 320 | .8 | 445 | .8 | 570 | | |
| .9 | 72.5 | .9 | 197.5 | .9 | 322.5 | .9 | 447.5 | .9 | 572.5 | | |

| Loco. Hrs. | T. E. Hrs. | Loco. Hrs. | T. E. Hrs. | Loco. Hrs. | T. E. Hrs. | Loco. Hrs. | T. E. Hrs. | Loco. Hrs. | T. E. Hrs. | Loco. Hrs. | T. E. Hrs. |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 3.0 | 75 | 8.0 | 200 | 13.0 | 325 | 18.0 | 450 | 23.0 | 575 | | |
| .1 | 77.5 | .1 | 202.5 | .1 | 327.5 | .1 | 452.5 | .1 | 577.5 | | |
| .2 | 80 | .2 | 205 | .2 | 330 | .2 | 455 | .2 | 580 | | |
| .3 | 82.5 | .3 | 207.5 | .3 | 332.5 | .3 | 457.5 | .3 | 582.5 | | |
| .4 | 85 | .4 | 210 | .4 | 335 | .4 | 460 | .4 | 585 | | |
| .5 | 87.5 | .5 | 212.5 | .5 | 337.5 | .5 | 462.5 | .5 | 587.5 | | |
| .6 | 90 | .6 | 215 | .6 | 340 | .6 | 465 | .6 | 590 | | |
| .7 | 92.5 | .7 | 217.5 | .7 | 342.5 | .7 | 467.5 | .7 | 592.5 | | |
| .8 | 95 | .8 | 220 | .8 | 345 | .8 | 470 | .8 | 595 | | |
| .9 | 97.5 | .9 | 222.5 | .9 | 347.5 | .9 | 472.5 | .9 | 597.5 | | |
| 4.0 | 100 | 9.0 | 225 | 14.0 | 350 | 19.0 | 475 | 24.0 | 600 | | |
| .1 | 102.5 | .1 | 227.5 | .1 | 352.5 | .1 | 477.5 | .1 | 602.5 | | |
| .2 | 105 | .2 | 230 | .2 | 355 | .2 | 480 | .2 | 605 | | |
| .3 | 107.5 | .3 | 232.5 | .3 | 357.5 | .3 | 482.5 | .3 | 607.5 | | |
| .4 | 110 | .4 | 235 | .4 | 360 | .4 | 485 | .4 | 610 | | |
| .5 | 112.5 | .5 | 237.5 | .5 | 362.5 | .5 | 487.5 | .5 | 612.5 | | |
| .6 | 115 | .6 | 240 | .6 | 365 | .6 | 490 | .6 | 615 | | |
| .7 | 117.5 | .7 | 242.5 | .7 | 367.5 | .7 | 492.5 | .7 | 617.5 | | |
| .8 | 120 | .8 | 245 | .8 | 370 | .8 | 495 | .8 | 620 | | |
| .9 | 122.5 | .9 | 247.5 | .9 | 372.5 | .9 | 497.5 | .9 | 622.5 | | |

TABLE FOR CONVERTING MINUTES INTO DECIMALS OF AN HOUR.

| | | | |
|-----------------------|---------------|-----------------------|-----------|
| 1 to 3 minutes..... | Do not count. | 34 to 39 minutes..... | .6 hour. |
| 4 to 9 minutes..... | .1 hour. | 40 to 45 minutes..... | .7 hour. |
| 10 to 15 minutes..... | .2 hour. | 46 to 51 minutes..... | .8 hour. |
| 16 to 21 minutes..... | .3 hour. | 52 to 57 minutes..... | .9 hour. |
| 22 to 27 minutes..... | .4 hour. | 58 to 60 minutes..... | 1.0 hour. |
| 28 to 33 minutes..... | .5 hour. | | |

Of course the question of working out the tractive effort hours in the dispatcher's office is optional. However, this is the only basis upon which the real measure of efficiency can be determined. Actual experience has shown that by the use of conversion tables such as are given herewith, the time required for such conversion is nominal. Fifteen or 20 minutes is enough for this work on a division with about forty freight engines of four or five different tractive efforts. It should, of course, be understood that such a table would be needed for each different size locomotive on the division, but by grouping all the locomotives of the same size, and adding their various delays, and making one conversion for the total instead of for each item, considerable time may be saved.

The part of the work requiring the most time is getting those who make up the details to correctly account for the full time. It is essential to know what every engine is doing each hour out of the 24. The expense of preparing such a report would not generally be more, and in many cases would be less, than that of preparing the present conglomerate mass of locomotive data. The expense of the additional work (if it is found to be additional) will depend on whether, under local conditions, it can be taken care of by the present force, or whether occasionally an extra clerk may have to be put on to take care of it. In the division office where the tabulation and summarization is made it should not require (assuming an assignment of approximately 40 freight engines and the running of 25 to 30 trains per day) over 5 or 6 hours of the time of a bright boy who knows how to make additions quickly and accurately.

Let any officer distributing power between several divisions ask a division superintendent about October 1: "How many engines can you spare?" The information he would get in response to such a query would not relieve much of a congestion. If there is a congestion to relieve, he must arbitrarily order engines away from some division. Which division he shall take the engines from is largely a matter of guessing on his part, because of the lack of sufficient current data to enable him to act with definite knowledge; and unless he orders specifically by engine numbers, selecting engines which are known to be in good condition, the chances are that the division receiving the power will really be burdened by having to haul the engines received "dead" to the shops for repairs.

Of course, it is impossible to officer a railway with men who see things exactly alike; and in many ways this probably is a good thing; but it is not impossible or impractical to prepare a report as suggested and show just what is done with the motive power, so that the chief dispatcher, trainmaster, superintendent, general superintendent and general manager have before them each day the details or the summarized results. All having similar information, each can draw his own conclusions from an analysis of the data. If, however, one or more

of the officers are of the class that do not believe in theorizing from statistics—preferring to theorize from practical observation or experience, probably because of past failures to reconcile statistical data—this should not prevent us from preparing the data so as to reflect the real situation. The officer preferring to theorize from practical experience is not to be censured, because he has probably been working with disjointed and unreliable statistics.

My idea is that with a comprehensive, correlated and reliable report the practical man will be able to agree with the so-called theorist; the real trouble having been that the theorist has to take the figures given him at their face value, while the practical man knows they are unreliable; having perhaps prepared them himself does not necessarily mean that the data is reliable, and, if it is, has the efficient and sincere officer anything to fear by letting the facts go to headquarters? No! I believe further that is no better way for the new or inexperienced superintendent to attain efficiency than by having it understood down the line that he will stand for almost any-

service. Again, there is a congestion to clear quickly, they will give widely varying answers to the questions whether there should be a reduction or increase of tonnage per train; whether engine crews should be pooled or assigned; whether the engine house or shop facilities or force, or both, are adequate for the present or for additional power; whether the coaling and water facilities are adequate for present or additional power; whether the track conditions are such that they would warrant a higher speed if the tonnage per train were reduced; whether the side track facilities are adequate for the present number of trains or more; whether it is advisable to run freight train in "fleets" or to string them out, the answer in each case depending on the individual's opinion as to whether delays caused by the meeting of trains would be increased or decreased by a change, and as to whether delays to power at terminals would be increased or decreased; and whether double heading on any part of a division is economical.

I cannot help believing that the local man with data, kept during dull as well as busy periods, and competent along the

| Conductor's Telegraph Report of Locomotive Service and Delays | | | | | | | | | | | | | | (C. T. 107-C.) | | |
|---|-------------------|-----------|----------|-------------------------------------|------------------------|---------------------------|---------------------|-----------------------|--------------|--------------|-------------------------------|-------|-------------------|----------------|------|---------------------|
| To Chief Dispr... Rock Island.....for Trip between..... Paris..... and Amsterdam.....during calendar day ending 11:59 p. m.... Jan. 1, 1911. | | | | | | | | | | | | | | | | |
| WEST OR SOUTHBOUND | | | | | | | | | | | | | | | | |
| Class of Svc. | Eng. No. | Time | | Time bet'n Term'l Term'l's | Total Miles Made | Actual Running Time | Analysis of Delays. | | | | | | | | | |
| | | Leaving | Arriving | | | | Meet'g | Station | Track | 16 Hr Law | Wrecks Derlnt W.O., &c. | Block | Equipm't Sig's | Loco's | Cars | Weather Cond'n's | Miscl's |
| A | B | BM | BN | BQ | BU | BX | DA | DF | DH | DJ | DM | DQ | DU | DX | FB | FG |
| Time | | 1900 | 2:20 P | 12 1/2 | 9:50" | 80 | | | | | | | | | | |
| Meet | Ex. 1432 Brussels | | | | | | | | | | | | | | | |
| Total | | | | | | | | | | | | | | | | |
| EAST OR NORTHBOUND | | | | | | | | | | | | | | | | |
| GA | GB | JH | JI | JK | JN | JS | JW | JZ | KB | KF | KH | KJ | KN | KS | KW | KZ |
| Total | | | | | | | | | | | | | | | | |
| TONNAGE SET OUT SHORT OF TRAIN TERMINAL DESTINATION ON ACCOUNT OF | | | | | | | | | | | | | | | | |
| Engine Failures | | | | Wrecks, Washouts, &c. | | | | Weather Conditions | | | | | | | | |
| Tons | Miles | Ton Miles | | Tons | Miles | Ton Miles | | Tons | Miles | Ton Miles | | | | | | |
| Set out | Short dest'n | MI | | Set out | Short dest'n | MJ | | Set out | Short dest'n | MK | | | | | | |

Size of Form 8 1/4 x 12 inches.

Conductor's Report of Engine Detentions.

thing except deliberate misrepresentation or the rendering of misleading reports. To ignore or wink at these things will in time be his undoing.

Can we not, then, sum up the matter of reports as follows: Will the report be of value to anyone? Can it be prepared in such a way as to be of value to more than one officer or department? If it is worth while making at all, it is worth while making carefully, a check being provided to assume its accuracy and provision being made for tabulation or graphic charts that will disclose its true significance. An explanation or analysis should be made by the party directly interested in the data which should correspond with what the data shows. If it does not, the basis of the report is wrong, the reports themselves are wrong, or the analysis is wrong. It should not take long to find the real trouble.

Many able railway men hold diametrically opposite views with reference to the methods which should be pursued to obtain given results under given conditions. For example, they differ widely as to what type of engine is best for any given

lines suggested, would be able definitely to answer many of these questions and defend his answers; and that he frequently would be able to put a monetary value opposite to most items, enabling a proper deduction to be made to the best place to spend money to operate more economically; and this is of course, the real object of keeping such data. A few moment's study of such information would enable a superintendent to know what is being done with his power; what the train and engine mileage amounts to; how the trains are getting over the road as a whole; and thus keep his attention on the principal variable factors in his transportation expense. By tabulating the data, a ready comparison may be made of each factor and any unusual conditions affecting the general results may readily be located and its bearing on the whole situation determined. The fact that there are so many factors involved, to my mind emphasizes the importance of correctly producing them and comparing definite data, rather than to make a rough guess or to depend on recollection of details. Can there be any question about the wisdom of a division officer having boiled-down facts promptly

placed before him so that he can at a glance know the following:

Per cent. of time the power is utilized between terminals.

Per cent. of time the power is in the hands of the mechanical and transportation departments at terminals.

Average speed of trains between terminals

Average speed of trains between
Total miles made by locomotives

Average miles made by locomotives including and excluding those in shops.

Effect of delays due to the meeting of trains on the average miles per hour between terminals, or of any other of the various factors that may be kept covering unusual local conditions.

A sample of the results which can be quickly shown is given below; this may be worked out daily, weekly or monthly, as desired:

| | Local Freight. | Dead Freight. | Time Freight. | Total. |
|---|-------------------|------------------|------------------|--------|
| Number of engines..... | 9 | 22 | 13 | 44 |
| Mech. Dep't time, per cent. of total..... | 15.0 | 62.0 | 30.0 | 44.0 |
| Heavy repairs, per cent..... | .... | 54.0 | .4 | 39.7 |
| Light repairs, per cent..... | .... | 14.2 | 1.4 | 10.7 |
| Engine house repairs, per cent..... | 80.0 | 28.3 | 85.7 | 43.3 |
| Ash pit repairs, per cent..... | 20.0 | 3.5 | 12.5 | 6.3 |
| Terminal detention, per cent. of total..... | 43.0 | 13.0 | 28.0 | 23.0 |
| Regular schedule, per cent..... | 92.0 | 21.0 | 41.7 | 55.3 |
| Stock, per cent..... | .6 | 3.2 | 19.2 | 7.6 |
| Fruit, etc., per cent..... | .... | 1.6 | 6.8 | 2.7 |
| Superior trains, per cent..... | .2 | .5 | .6 | .4 |
| Insufficient tonnage, per cent..... | 1.2 | 50.3 | 16.1 | 20.1 |
| Rest for crews, per cent..... | 1.2 | 6.2 | 4.7 | 3.8 |
| Call time, per cent..... | .5 | 2.1 | 1.1 | 1.2 |
| Miscellaneous, per cent..... | 4.3 | 14.2 | 9.8 | 8.9 |
| Road service, per cent. of total..... | 42.0 | 25.0 | 42.0 | 33.0 |
| Meeting trains, per cent..... | 9.3 | 15.1 | 14.9 | 13.5 |
| Station work, per cent..... | 47.3 | 11.4 | 9.7 | 20.3 |
| Track conditions, per cent..... | .2 | .3 | .5 | .3 |
| Wrecks, etc., per cent..... | .2 | .1 | .3 | .2 |
| Block signals, per cent..... | .... | .5 | .6 | .4 |
| Equipment failures: | | | | |
| Locomotives, per cent..... | .1 | .7 | .6 | .5 |
| Cars, per cent..... | .5 | 1.8 | 1.7 | 1.4 |
| Miscellaneous, per cent..... | .6 | 2.6 | 2.4 | 2.0 |
| Actual running time, per cent..... | 42.0 | 67.5 | 69.3 | 61.4 |

LOCOMOTIVE MILEAGE AVERAGES

| LOCOMOTIVE MILEAGE AVERAGES. | | | | |
|---|------|------|------|------|
| All locomotives: | | | | |
| Including heavy and light repairs, per day | 77 | 77 | 150 | 98 |
| Excluding heavy and light repairs, per day | 77 | 135 | 151 | 125 |
| Between terminals: | | | | |
| Including delays, per hour..... | 7.6 | 13.0 | 14.8 | 12.2 |
| Excluding delays, per hour..... | 18.1 | 19.3 | 21.4 | 19.9 |

All of this information and more can readily be compiled by a clerk between midnight and 7:00 a. m. from such a report as is outlined in this article, so that a division officer can readily locate the particular item in the operation of his division, which is varying or has a vital bearing on the cost or net results.

The advantage of such a record to either the practical man, or to the so-called theorist, is that it would enable him quickly to demonstrate the value or lack of value of any particular plan tried on a division. Local conditions are so dissimilar that comparisons between divisions are apt to be valueless; but this record could be made of inestimable value as a means of comparing the division with itself; and doubtless in many instances it would surprise an officer whose recommendations for improvements had been acted on to find that the additional facilities afforded had so slight a bearing on the final results that in the light of more complete data it would have been better to have applied the money in some other direction.

There are times on all roads when the maximum business is offering and all facilities are being taxed to their limit, that questions of vital import arise with reference to the method by which the maximum tonnage may be moved within a given time, and while there can be no question that full tonnage trains is the direction toward which operating officers must look to obtain economy, there must be a happy medium, and this happy medium cannot be the same over all divisions. Each division must be treated as a unit and its peculiarities taken into account if the best results are to be obtained; and such information as I have indicated, in the hands of any one competent to analyze it, would quickly indicate the proper procedure.

Form Used in the Despatcher's Office for Tabulating Engine Detentions.

Form for Tabulating Engine Detentions (Continued).

To show how such knowledge may be used to determine the best plan to follow, let us assume the following conditions:

Division, 100 miles long.

Freight engines, average 25,000 lbs. tractive effort.

Dead freight rating, 1,000 gross tons.

Average speed of trains between terminals, 10 m. p. h.

Average delay to power at each division terminal, 12 hours.

Question: Would a reduction of tonnage to 800 tons, or 20 per cent., enabling trains to make an average speed of 15 m. p. h. between terminals, result in an increase or a decrease in the gross ton-miles moved per day per locomotive in the direction of traffic; their being no change in the average delay at terminals?

Answer: A decrease of 3,600 gross ton-miles moved per day, or over 6 per cent. would ensue.

Question: Would there be an increase or decrease in locomotive miles per day?

Answer: An average increase of 16 miles, or over 14 per cent.

It is quite evident that unless a material reduction in terminal delay to power is obtained concurrently with the inauguration of such a practice, the expense will materially increase, and there will be an actual decrease in the movement. If, however, a reduction of terminal delay can be effected by reason of lighter tonnage while on the road and a shortening of the time consumed between terminals, let us see how it would work out with all conditions the same as in the preceding example, except an average terminal delay of 10 hours instead of 12 hours.

Question: With a reduction of 800 tons, an average speed of

men, fuel, oil, water, supplies, proportion of loss and damage, wrecks, etc., amounts to 35 cents per train mile, then the additional train miles, 36, would cost \$12.60 more per day per locomotive, which amount deducted from the increased gross earnings per day leaves a balance of \$1.44 net per day.

To illustrate that these same percentages of variation do not apply to a division of a different length, I have worked out in the accompanying table the same kind of a comparison on a division 150 miles in length.

| | Miles per hour | 100-Mile Division. | | 150-Mile Division. | |
|--|----------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | Average Terminal Delay. | Average Terminal Delay. | Average Terminal Delay. | Average Terminal Delay. |
| | 12 hrs. | 10 hrs. | 12 hrs. | 10 hrs. | |
| Daily basis, per locomotive. | | | | | |
| Average time between terminals in direction of traffic..... | 10 | 5.4 hr. | .... | 6.6 hr. | .... |
| Average time between terminals in direction of traffic..... | 15 | 4.2 hr. | 4.8 hr. | 5.4 hr. | 6 hr. |
| Average locomotive miles per day in direction of traffic..... | 10 | 54 mi. | .... | 66 mi. | .... |
| Average locomotive miles per day in direction of traffic..... | 15 | 63 mi. | 72 mi. | 81 mi. | 90 mi. |
| Average locomotive miles per day (both directions)..... | 10 | 108 mi. | .... | 132 mi. | .... |
| Average locomotive miles per day (both directions)..... | 15 | 126 mi. | 144 mi. | 162 mi. | 180 mi. |
| Increase in miles per day..... | .. | 16 mi. | 36 mi. | 30 mi. | 48 mi. |
| Cost increase train miles at 35c. per mile | .. | \$5.60 | \$12.60 | \$10.50 | \$16.80 |
| Average gross ton miles produced per day per locomotive in direction of traffic: | | | | | |
| Basis 1,000 gross tons per train mile | 10 | 54,000 | .... | 66,000 | .... |
| Basis 800 gross tons per train mile | 15 | 50,400 | 57,600 | 64,800 | 72,000 |
| Increase or decrease, gross ton miles | .. | -3,600 | +3,600 | -1,200 | +6,000 |
| Increase or decrease, revenue on gross ton (basis 3.9 mills) | .. | -\$14.04 | +\$14.04 | -\$4.68 | +\$23.40 |

COMPARATIVE STATEMENT OF CONDITION OF FREIGHT POWER.

JANUARY 1, 1911, vs. JANUARY 1, 1910.

| | January 1, 1911. | | | January 1, 1910. | | | Increase (+); Decrease (-). | | | T. P. in 1,000 lbs. | | |
|--------------------------------------|------------------|---------------------|------------------------|------------------|---------------------|------------------------|-----------------------------|---------------------|-----------|---------------------|-----------|--|
| | Number Locos. | T. P. in 1,000 lbs. | | Number Locos. | T. P. in 1,000 lbs. | | Number Locos. | T. P. in 1,000 lbs. | | Total. | Per Cent. | |
| | | Total. | Per Cent. Grand Total. | Aver- age. | Total. | Per Cent. Grand Total. | Aver- age. | Total. | Per Cent. | | | |
| Good for 12 months..... | 35 | 1,047 | 34.2 | 29.9 | 35 | 975 | 35.3 | 27.8 | .... | + 72 | + 7.4 | |
| Good for 6 months..... | 31 | 835 | 27.3 | 26.9 | 29 | 785 | 28.4 | 27.0 | .... | + 50 | + 6.3 | |
| Good for 3 months..... | 15 | 397 | 12.7 | 26.4 | 18 | 461 | 16.7 | 25.6 | .... | - 64 | - 16.1 | |
| Total good for 3 months or more..... | 81 | 2,279 | 74.4 | 28.1 | 82 | 2,221 | 80.4 | 27.0 | - 1 | + 58 | + 2.6 | |
| In Service: | | | | | | | | | | | | |
| Needing heavy repairs..... | 3 | 76 | 2.5 | 25.3 | 6 | 165 | 6.0 | 29.1 | - 3 | - 89 | - 117.1 | |
| Needing light repairs..... | 1 | 20 | .7 | 20.0 | 1 | 15 | .5 | 15.0 | .... | + 5 | + 33.3 | |
| Total serviceable | 85 | 2,375 | 77.5 | 27.9 | 89 | 2,401 | 86.7 | 26.9 | - 4 | - 26 | - 1.1 | |
| Waiting: | | | | | | | | | | | | |
| For heavy repairs..... | 8 | 252 | 8.2 | 31.5 | 3 | 82 | 3.0 | 27.3 | + 5 | + 170 | + 207.3 | |
| For light repairs..... | 1 | 26 | .8 | 26.0 | .... | .... | .... | .... | + 1 | + 26 | .... |  |
| In shops | 13 | 387 | 12.6 | 29.7 | 9 | 265 | 9.6 | 29.4 | + 4 | + 122 | + 46.0 | |
| Condemned | 1 | 23 | .8 | 23.0 | 1 | 15 | .5 | 15.0 | .... | + 8 | + 53.3 | |
| Total unserviceable | 23 | 688 | 22.5 | 29.8 | 13 | 362 | 13.1 | 27.8 | + 10 | + 326 | + 90.1 | |
| Grand total | 108 | 3,063 | 100.0 | 28.3 | 102 | 2,763 | 100.0 | 27.0 | + 6 | + 300 | + 10.9 | |

15 m. p. h. between terminals and an average terminal delay of 10 hours, would there be an increase or decrease in gross ton-miles per day per locomotive as compared with the full tonnage trains, 10 m. p. h. speed and 12 hours terminal delay?

Answer: An increase of 3,600 gross tons one mile, or over 6 per cent.

Question: Would there be an increase or decrease in locomotive miles per day?

Answer: An average increase of 36 miles, or over 33 per cent.

Question: In the case just cited, would the increased expense of train mileage equal or exceed the increased revenue produced by the locomotive per day.

Answer: This of course depends on the average earnings per net ton-mile and the expense per train mile after eliminating overhead expense and fixed charges.

If we assume average earnings of 9 mills per net ton-mile, and that the net ton-mileage on the road is 43 per cent. of the gross, it would be equivalent to average earnings per gross ton-mile of \$.00387, or 3.9 mills, 3,600 gross tons one mile would, at the rate of 3.9 mills per gross ton, equal an increased earning of \$14.04 per day, this being based only on the traffic moving in the direction of the greatest volume of movement.

Suppose the expense for wages of engineers, firemen, train-

A comparison of the condition of motive power is also of considerable value and below is shown a method which appeals to me as of value in this respect, in that it shows not only the number of locomotives, but the total tractive effort thereof. The report should be compiled from data prepared by the mechanical department as to the physical condition of each locomotive on the first of each month showing: Good for 12 months; good for 6 months; good for 3 months; in service needing heavy repairs; in service needing light repairs; waiting shops for heavy repairs; waiting shops for light repairs; in shops undergoing repairs and condemned.

An analysis of the report shows that with an increase of the equivalent of 6 engines with an aggregate tractive effort of 300,000 lbs., or 10.9 per cent., there is 1.1 per cent. less power available for service; there is 46 per cent. more in the shops and 207.3 per cent. more held outside of shops awaiting heavy repairs. If, under these conditions during January an increase of 10 or 15 per cent. in gross ton-miles was moved, it would clearly indicate an increased utilization of the power; or, if business was not moved as well as last year, it would clearly point out that all of the increased power acquired by the purchase of new engines and some of the old power had been absorbed by the increase in bad order power, and, therefore, that really a smaller amount of power was available for service.

GOVERNMENT REPORT ON FORT WAYNE DERAILMENT.

H. W. Belnap, chief inspector of safety appliances, has made to the Interstate Commerce Commission a report on the derailment of passenger train No. 28 on the Pennsylvania Lines West of Pittsburgh, at Fort Wayne, Ind., August 13, in which 4 trainmen were killed and 22 trainmen and 38 passengers were injured, 17 of the injured trainmen being dining-car or sleeping-car employees. This accident was reported in the *Railway Age Gazette* September 15, page 502. We give the principal facts brought out by Mr. Belnap which were not given in our earlier account. The account printed September 15 says that the two engines, backing from Fort Wayne west to get the disabled train, were stopped at a point near where the derailment afterward occurred and that both of the engine crews looked over the layout at that place. Mr. Belnap's report makes no mention of this. He is silent also as to the testimony to the effect that fire was flying from the brakeshoes at the rear of the train just before the derailment. The report gives many particulars of the location and circumstances, but for the lack of a diagram these cannot be made clear to one unfamiliar with the location.

The company reported the accident by telegraph on the 14th and safety appliance inspectors Smith, Coutts and Archer arrived at the place the next morning. The representatives of the Interstate Commerce Commission acted jointly with the railroad commission of Indiana. Mr. Belnap took part in a hearing held September 7. The testimony of engineman Malone, who had charge of the leading engine, and who was badly injured, was taken in a hospital, September 13, by Commissioner Payne and Chief Inspector Scott of the state commission.

The train had traveled the last 36 miles in 33 minutes and it is scheduled over this part of the road at the rate of 124 miles in two hours.

The two eastern-division engines were sent west from Fort Wayne by order of the assistant trainmaster (whose name is not given). Engineman Malone in his testimony said that the depot master came to the engine and gave him the order. Malone asked for a pilot and the depot master said "all right." Later, at the office, Malone asked "Mr. Richardson" (title not given) for a pilot, and he said that none was needed. At this point the testimony seems to indicate that the engines went west for a part of the way on the eastbound track, but there is no explanation of this, and the statement is not clear. Malone had not been over this part of the road for nearly two years, and the other engineman not since September, 1910. It will be remembered that the only formal information which had been given to Malone, as to the crossover which must be passed at reduced speed, was a bulletin order which he had signed ten days previous. His testimony indicates that he had forgotten about this order; but he must have had some notion of the situation, for he says that to his fireman, who had been over the road "a little while previously," he said, "What do you know about this track?" The fireman replied, "It is all right to Broadway and fifteen miles an hour from there in [to Fort Wayne]." It is impossible to make out from the report whether this information given by the fireman was or was not correct. Malone says that he shut off steam and tried the air approaching the "Junction." The location of the Junction, however, is not clearly indicated and this testimony appears to be rather indefinite.

Mr. Belnap here goes into a long discussion of the rules for testing air brakes and finds that the test made when these engines were coupled to the train was not thorough, and that the road does not require enginemans to make a running test—that is, to test the brakes after the train has run a short distance from its starting point. He concludes that "no one has any positive knowledge" as to whether or not this train had air brakes in good working condition. At the same time there is nothing to indicate that there was any failure of air brakes,

or that, if there was such failure, it contributed to the disaster. Malone says that he applied the emergency brakes when he saw the sharp curve ahead of him, but apparently this was too late to be of any benefit. (Nothing is said in the government report as to the testimony of the surviving fireman of the second engine, that he warned his engineman of the excessive speed approaching the crossover, and that the engineman signaled to the leading engine to slacken speed.) There was no slow-board to indicate approach to this short temporary crossover; but the practice of the road is said to be to set up slow-boards where the route is in any way obscure or difficult to locate. Although order No. 83, requiring low speed at this point, had been issued August 1, and signed for by these enginemans eleven days before the accident, there was another order, No. 86, to go into effect on the day following the accident, which was signed for by these men only about three hours before the disaster happened. According to this later order (evidently announcing change in tracks), schedule speed was to be allowed at the place of the accident at nine o'clock on the morning of the 14th.

This part of the Pennsylvania Lines is equipped with automatic block signals, but, because of the track elevation work a short section, including the point where the derailment occurred, is worked by the manual block system.

The speed of the train is believed to have been 65 miles an hour. Several six-wheel trucks were "buried entirely in the rock ballast." To the steel cars can be attributed the fact that not a passenger lost his life and only one was seriously injured.

Mr. Belnap's conclusions are that the engineman in control of the train was unfamiliar with the track; that he failed to observe the low speed rules; that no signal or slow-board was provided to indicate the location of the short crossover and therefore that the signals and rules were not adequate; that there was no official knowledge that employees regularly and promptly acknowledged bulletin notices by their signatures; that the air brake tests are not adequate; that in this case the air brake testing rules were not properly complied with; that notice of conditions like these here found should be given by train orders and slow-boards; that enginemans should not be required or permitted to run engines of passenger trains over unfamiliar tracks except with a competent pilot; and that all-steel passenger cars should be required to be used in high speed trains "at the earliest practicable date." He also repeats his recommendation, made in the case of the derailment at Bridgeport, Conn., in July, that automatic stops should be installed generally, and that on high speed tracks not having automatic stops trains should be signaled to proceed over a short crossover only after they have been brought to a stop.

FOREIGN RAILWAY NOTES.

The Railways Standing Committee of Victoria has recommended to the legislative assembly the extension of the Swan Hill Railway through Hyah to Piangil, about 29 miles, at a cost of \$420,500. It is said that the line will ultimately be continued to Narrong, near the junction of the Murray and Murrumbidgee railways, so as to serve the Balranald district of New South Wales.

Final plans for the extension of a branch of the Central of Brazil Railway which will connect the station, G. Portella, on that railway with Vassouras on the Spaucahy Railway, also for the extension of a short line to Itacurussa have been approved. One of the most important of the recent extensions on the Central is to be a branch to Monte Claros, 37 miles long, and to cost \$800,000. Twenty-one miles of the line running north from Lafayette are to be changed to broad gage in accordance with the general plans for the standardization of the main line of the Central of Brazil running into the state of Minas Geraes from Rio de Janeiro.

SWEDISH STEEL.

At the meeting of the New York Railroad Club, held on the evening of Friday, October 20, A. R. Roy read a paper on Swedish Steels, the intent of which was to show the superiority of that brand of steel over others on the market. The early portion of the paper was devoted to an historical statement of the development of irons and steels ending with data showing the high regard with which Swedish steels have been held in the markets of the world for the past one hundred and seventy years.

Nature gave Sweden the best iron ores in the world. It would appear that the chemical amalgams inherent in the ore in the state of nature are such that when the ore is worked it imparts to the final product qualities not to be found in other irons, although much of this amalgam is apparently eliminated in the process of manufacture. The most recent discovery appears to be that vanadium is found present in the natural ore. Analysis of Swedish iron shows no trace of vanadium. It is possible that the heat in the furnace eliminates all trace of vanadium, but not before it has imparted to the iron the purity that makes the ore of Sweden so famous.

Charcoal, the purest fuel, is used in Sweden of necessity, as Sweden has no coal beds of her own. It may be unfortunate for the wealth of Sweden's iron masters that there is no coal handy for use, but it is a decided advantage to the world in general. Could Sweden use coal in her furnaces the chances are that the quality of her iron would deteriorate. By using charcoal the gases that are impregnated into the molten fluid steel by the employment of coal or coke is completely avoided. Naturally, a steel is produced that is much purer than any that can be made with coke or coal, as is the custom in other countries. Further, large quantities of iron are never produced at a time. The largest converters have a capacity of not more than $2\frac{1}{2}$ to 12 tons, while in America and England there are converters with treble the capacity. The consequence of this is that greater care is taken in the manufacture and there is a more even quality and homogeneity in the steel produced for the simple reason that it is easier to boil more thoroughly a small quantity of matter than a larger one—and boil it evenly through and through. Greater care is taken in Sweden in manufacturing, because the use of charcoal necessarily prohibits production on a large scale; therefore, quality not quantity is Sweden's principal aim.

Discussion.—Very little was added in the discussion in regard to the physical and chemical properties of the Swedish steels. Much was said as to their high qualities in a general way, but nothing as to the metallurgical methods pursued in order to attain those qualities. Attention was first called to the development of American steels, and it was asserted that these were equal to any in the world, and that American manufacturers could turn out an unequalled product if they were given the time and were paid for their labor. There was a time when crucible steel was the only kind that was considered fit to put in a firebox, but this limitation has long since been swept away. First the acid open-hearth steel came in and then the basic, and though the latter process is acknowledged to be inferior to the former, no discrimination is made in specifications, by at least one large road, against the basic steel. Processes of steel making have been so improved that good steel is now made from poor materials. Naturally the best ores are mined first, but with the development of furnace practice the proper ores are coming into use.

It is probable that Sweden can continue to produce her present output indefinitely, though an increase up to the furnace capacities of those of the United States will be out of the question, unless the electric furnace is developed to a point of economical operation. Some electrical furnaces are being introduced. As a contrast between the capacities of the Swedish furnaces and those of the United States where capacities of

100 tons are not uncommon, the Swedish furnaces can rarely melt more than 12 tons. The metal is cast in small ingots and the crop ends average 35 per cent., so that only the very best portion of an exceedingly high grade metal is put upon the market. This is shown by the small sizes of Swedish billets that are available. The greatest length obtainable of a Lancashire bar measuring 5 in. x 5 in. is 3 ft., and if the highest grade of Swedish iron is to be obtained the specifications must not merely call for Swedish iron, but Swedish Lancashire bar.

The real value of Swedish steel is shown in the service that can be obtained from it in construction work and in the abuse which it can stand at the hands of unskilled blacksmiths without being ruined. In construction work its economic value is shown by the speed with which drilling can be done, as compared with other steels. A speaker estimated a saving of $3\frac{1}{3}$ per cent. in the time of drilling, and this when multiplied by a large number of drills may mean the difference between profit and loss on a contract.

REPORT ON UNIFORM CLASSIFICATION.

The committee on uniform classification of freight and simplification of tariffs made a report to the national convention of railway commissioners at Washington, October 11, which sets forth the situation in regard to classification so lucidly that we quote below some paragraphs from the report. The chairman of this committee is Interstate Commerce Commissioner E. E. Clark. It will be observed that the work of the railways in this difficult matter is fully approved.

The separate classifications now in force have been built up through years of operation in the different classification territories, the carriers in each territory considering particularly their own interests and acceding in numberless instances to the desires or demands of their patrons.

In bringing about uniformity the prime interest of the carriers is their revenue, to which, of course, is added the interest of each carrier that the shippers upon its line are not at a disadvantage as compared with competing shippers on competitive railways. The shippers are interested in the total of the charges which they pay and in seeing that they are not at a disadvantage as compared with their competitors.

At first blush it might be said that if the railways would bring about uniform classification entirely by reductions in charges it would be satisfactory to shippers, but . . . it might contain elements of discrimination against some of them which would be of more importance to them than the measure of the rates they pay. In its 1910 convention this association recommended that the Interstate Commerce Commission take the necessary steps to secure uniformity in classification . . . The members of your committee have given this matter much consideration and thought, and the deeper we go into the subject, the more we appreciate and realize the multitude of difficulties that must be met and overcome, and the magnitude of the work of bringing into uniformity all of the rules, regulations, specifications, requirements, minimum weights, and ratings contained in the present classifications and the multitudes of exceptions thereto.

We have inquired with considerable particularity as to the progress of the work undertaken and so far accomplished by the carriers' committee, composed of three representatives from each of the three classification territories, which, as we are convinced, has been intelligently, efficiently and industriously working in good faith, to prepare for adoption by the carriers uniformity in the particulars of rules, descriptions, specifications and minimum weights. The carriers' committee is composed of men of skill and wide experience in classification matters, and if such committee, working, as we are convinced this committee has done, in good faith and industriously, is necessarily employed for so long a period in this work, it seems obvious that a less experienced committee must either take a substantially greater time to per-

form the same work or must do it in a less efficient and consequently less satisfactory manner . . . The committees in charge of the several present classifications are giving due consideration to the provisions of the other classifications, and are seeking to bring about uniformity in different features and items as changes are made. Every such step contributes toward ultimate uniformity.

It is better for all concerned to permit the present plan of action to continue so long as substantial and continuing progress is thus made, rather than to now undertake to prepare and prescribe a uniform classification. We also think that behind this effort on the part of the carriers there should be the spur of continued interest and activity on the part of all interested or vested with any authority in the premises, and a definite understanding, that if continued, and substantial progress is not made, the work will be undertaken through other means by those having authority so to do.

Experiences of the past justify, we think, the conclusion that even if uniform classification were today agreed upon by carriers and shippers, competitive influences and the desire to get traffic would very soon destroy the uniformity unless it were supported by the force of authority in law to require adoption, maintenance and observance thereof.

More or less suspicion lurks in the minds of some, but it is frequently found that protests against proposed changes are based in misunderstandings. Uniformity can never be reached as the result of the adoption of the views of the extremists on either side.

In the work of preparing uniformity of ratings many objections would be averted if the carriers would invite one representa-

parent all along in recent years and is apparent today. There is yet much room for improvement, but your committee is not prepared to recommend the adoption of a uniform form of tariffs for the railroads of the United States.

It would contribute much to simplification if each road would arrange all of its commodity rates upon the same commodity in one tariff.

IMPROVED SMOKE CHART.

BY M. E. WELLS,

Assistant Master Mechanic, Wheeling & Lake Erie, Brewster, O.

The work of reducing the smoke from locomotives in Cleveland has been carried on enthusiastically by the railways entering that city. It was found, however, to be very difficult to estimate the percentages of smoke with the Ringleman smoke chart, as it has to be set up 50 ft. from the observer, making it practically impossible to obtain accurate results for the locomotives, which are in motion. The improvement shown in the accompanying illustration was made by the writer. This chart corresponds to the Ringleman chart, but can be held in the hand while estimating, and gives all conditions of smoke from 0 to 100 per cent., instead of only 20, 40, 60 and 80 per cent. as given on the Ringleman chart.

The railways are co-operating with the city smoke inspector, and have arranged monthly meetings of the road foremen of engines, railway smoke inspectors, and others directly in charge of locomotive operation on all the roads entering Cleveland. The ways and means of smoke reduction and the general subject of fuel consumption are taken up and discussed. The city smoke



Improved Smoke Chart.

tive of the state commissions and one representative of shippers from each classification territory, together with one representative of the Interstate Commerce Commission, to sit with the committee . . . for the purpose of presenting to the committee views of their constituents on certain phases of the work, and of keeping their several principals informed as to the general progress of the work, while, at the same time, equipping themselves to give needed and dependable advice to their principals with regard to the work as a whole, or with regard to certain features of it when such work or such features come up for final adoption. We believe that wherever it has been tried the policy of intelligent, fair-minded representatives of contending parties sitting down together, to a temperate exchange of views has been found profitable, and to make for substantial progress and to greatly reduce misunderstandings as to purpose, policy and facts.

A study of this work leads to the thought that uniformity in classification can perhaps only be reached by resort in some instances to additional commodity rates . . . Your committee does not wish to be understood as suggesting that uniform classification is impossible, but the work is of much greater magnitude than was at first thought by anyone . . . We do not see occasion for recommending further legislation on this subject.

SIMPLIFICATION OF TARIFFS.

The practice of issuing tariffs covering wide territory and applicable to large volumes of traffic through joint agencies has been followed for a long time. A careful study of the situation leads to the conviction that it would be more harmful than helpful if a specified form of tariff were prescribed for use by all carriers in the different sections of the country . . . Steady and substantial progress in the simplification of tariffs has been ap-

inspector is invited to these meetings and enters into the discussions. The arrangement has worked out splendidly and considerable competition has been aroused among the different roads. The roads with the best showing are constantly making efforts to hold their records, while those with the poor records are continually trying to better them. This co-operation between the city inspector and the railway inspectors puts the matter on a very smooth running basis, and there is no friction, as everybody feels that each one is doing the best he can.

There is a general smoke committee composed of the higher railway and the higher city officials, of which D. R. McBain, superintendent of motive power of the Lake Shore & Michigan Southern, is chairman. This committee only meets occasionally. The accompanying table gives an average of the smoke percentages on different railways entering Cleveland for the first six months in 1911. For obvious reasons letters are substituted for the names of the different railways.

AVERAGE SMOKE PERCENTAGES—CLEVELAND, OHIO.
First Six Months of 1911.

| Name of Road. | Number of Observations. | Average, Per Cent. |
|---------------|-------------------------|--------------------|
| A | 426 | 3.16 |
| B | 165 | 4.67 |
| C | 325 | 6.23 |
| D | 422 | 6.37 |
| E | 391 | 6.63 |
| F | 397 | 6.88 |
| G | 268 | 7.30 |
| H | 191 | 12.88 |

The construction of a railway in Victoria from Bairnsdale, about 170 miles east of Melbourne, to Orbost, about 61 miles, will be commenced shortly. The estimated cost is \$1,930,000. It will be the most important railway recently built in Victoria.

THE DESIGN OF RAILWAY BRIDGE ABUTMENTS.*

BY J. H. PRIOR,

Assistant Engineer, Chicago, Milwaukee & St. Paul.

The following paper gives the result of an investigation ordered by C. F. Loweth, chief engineer of the Chicago, Milwaukee & St. Paul, and made by the writer.

A railway bridge abutment is ordinarily a masonry structure which gives vertical support to one end of a steel span, and at the same time gives whatever lateral support is necessary to prevent the adjoining embankment from slipping into the stream.

The most common type has a cross-section similar to that shown in Fig. 1, in which a is the bridge seat, consisting of a horizontal surface carrying the steel span; b is the back wall which supports the embankment and prevents its spilling forward on the bridge seat; the base e of the back wall b being made of such width as will make the back wall stable against overturning on account of the lateral pressure $R-1$ of the earth; c is the main body of the neatwork, and must have sufficient base f so that it will also be stable against overturning from the lateral pressure of the earthwork $R-2$; d is the footing, which must have a base g large enough to carry all the vertical

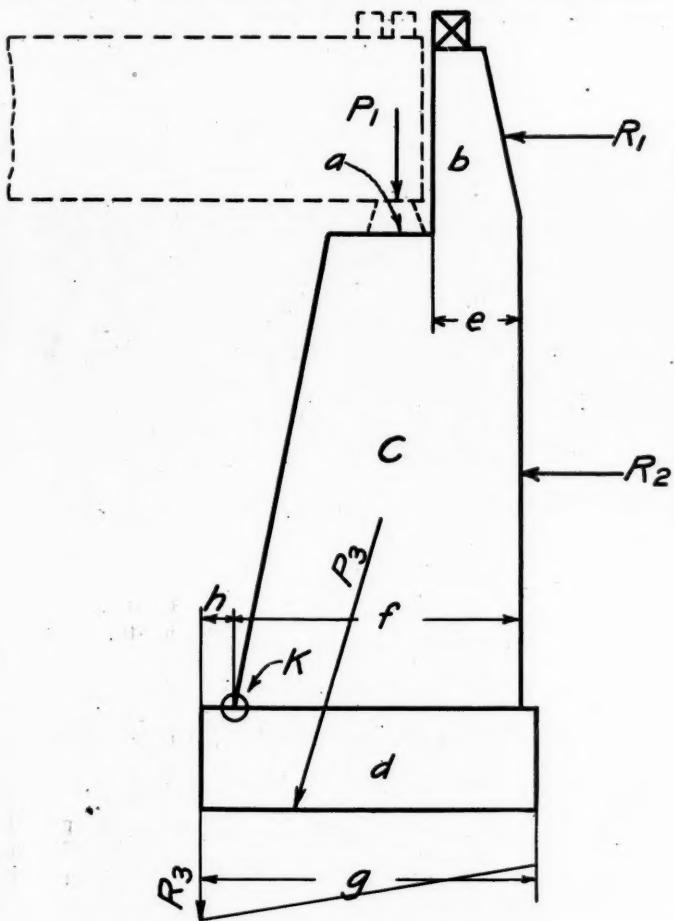


Fig. 1—Common Type of Abutment.

loads, and offset h should be large enough to keep the pressure at the toe of the footing $R-3$ within the allowable limit.

The three principal types are the wing, U, and T abutments. In the wing abutment the wings keep the embankment from slipping into the stream. In the U abutment the wings are made parallel to the track, thus giving the lateral support to the embankment which is required to extend the embankment to the bridge seat. In the T abutment the floor is supported directly back of the bridge seat by the stem of the abutment,

which carries the track back to a point where the embankment is of sufficient height to support it.

In addition to conforming to the ordinary laws of structural design, properly designed abutments should have the following properties, which may be called major requirements, because they affect the integrity of the structure:

m₁. The neatwork should be stable against overturning by revolving on the line k , Fig. 1, at the intersection of the front face of the neatwork and footing, and should also be safe against crushing on the same line.

m₂. The abutments should be stable against sliding, either

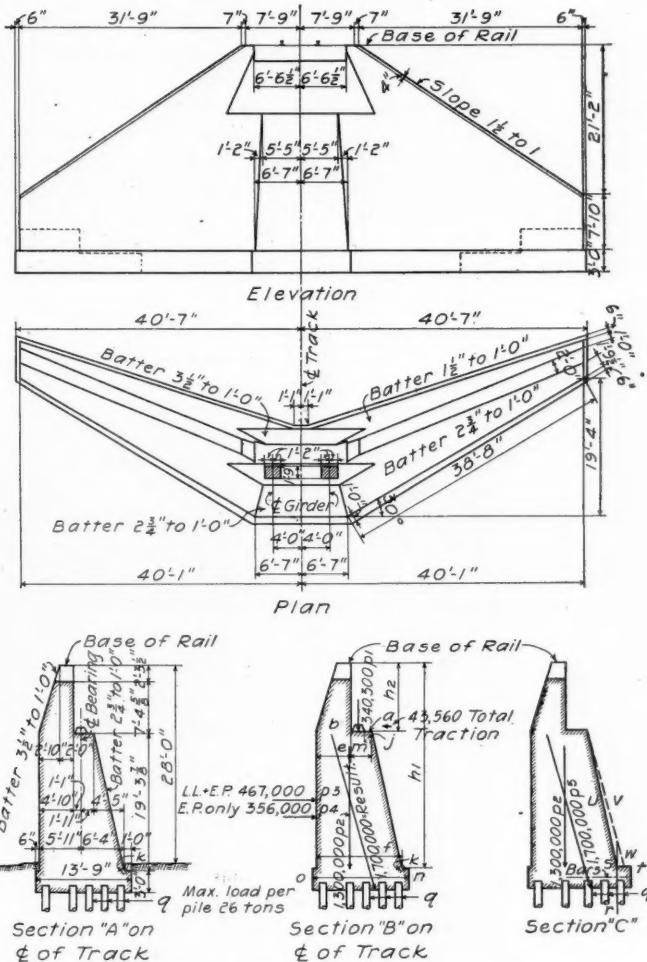


Fig. 2—Type B₁; Plain Concrete Wing Abutment, with Plain Concrete Backwall.

by the neatwork sliding on the footing or the footing sliding upon the foundation bed.

m. The pressure of the toe of the footing upon the foundation should not be excessive.

They should have the following properties, among others, which may be called minor requirements:

n₁. The abutments should protect the bank against scour.

n₂. The abutments should prevent the embankment drainage.

from washing away the shoulder of the bank adjacent to the back wall.

ns. The abutments should provide a joint which will support the track in an easy and continuous manner from embankment to superstructure.

n₄. The abutment should be easily drained.

As by far the greater number of abutments being built are either of plain or reinforced concrete, the term "Design of Bridge Abutments" at present means the design of bridge abutments in concrete masonry.

In order to compare the properties and economy of the various types, it was necessary to assume the same conditions in the

*Abstracted from Bulletin 140 of the American Railway Engineering Association. Copyrighted by the association.

design of all types. The more important assumptions which were made for this purpose are as follows:

- (1) The height of the abutment is the distance from the base of rail to the natural ground.
 - (2) Slope of fill $1\frac{1}{2}$ to 1.
 - (3) Slope of the natural ground away from stream or bridge opening 4 to 1.

PLAIN CONCRETE ABUTMENTS

Type B₁.—The plain concrete masonry abutment without reinforcement in the back wall, type B₁, is shown in Fig. 2. The cross-section of the abutment, marked "section B on the center line of track" is determined about as follows:

The distance h_2 , from the base of rail to the top of the bridge seat a , is determined by the depth required by the floor, girders and bearings of the superstructure; and in new work the abutment must conform to these dimensions. The dimension e_1 , which is the width of the back wall at its base, is taken as $4/10 h_2$ if the lateral pressure of the earthwork tending to overturn the back wall is alone considered, or it is taken at $5/10 h_2$ if a slight further provision is made for the overturning action of frost in the bank. The width of the bridge seat m is determined by

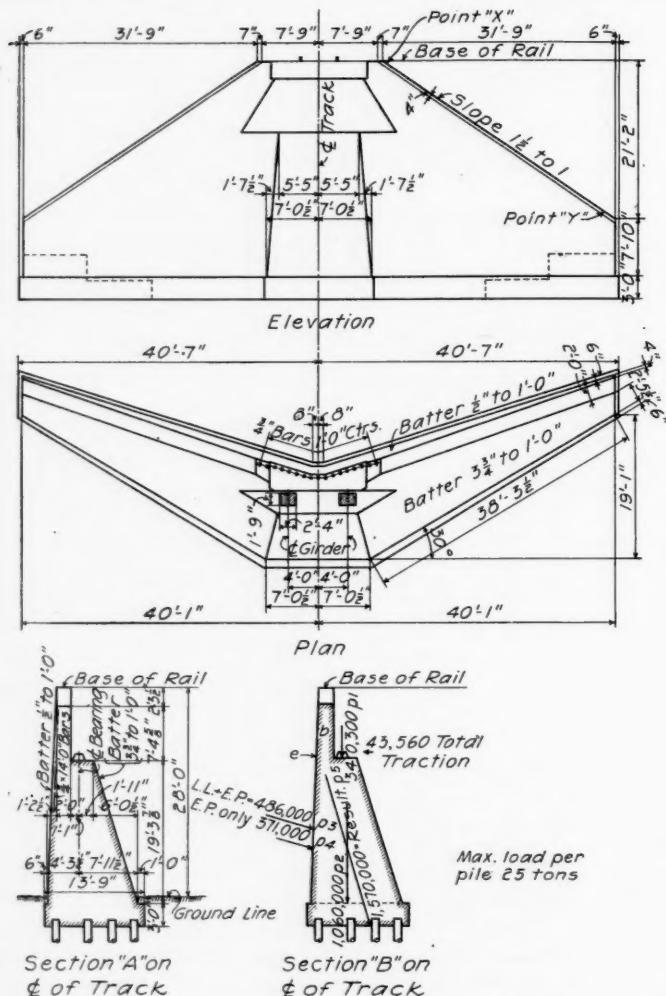


Fig. 3—Type B₂; Plain Concrete Wing Abutment with Reinforced Backwall.

the width required for the superstructure bearings plus whatever distance j is required to keep the bearings back far enough from the outer edge of the bridge seat to prevent the outside corner of the bridge seat from being sheared off in a diagonal direction.

The position of the ground line and the character of the foundation determine the distance h_1 from the base of rail to top of footing. If the base of the neatwork f is made $4/10$ of the distance h_1 , the neatwork is stable against overturning.

or crushing on the line k , at the lower edge of the neatwork. The dimension f together with the width of bridge seat m and thickness of back wall e having been determined, we have the choice of setting the bridge seat and back wall vertically over the rear edge of the footing, or of locating the bridge seat and back wall nearer the front of the footing, thus decreasing the length of our superstructure at the expense of an increased bearing on the toe of the foundation.

Type B₂.—Abutment B₂ is similar to abutment type B₁, ex-

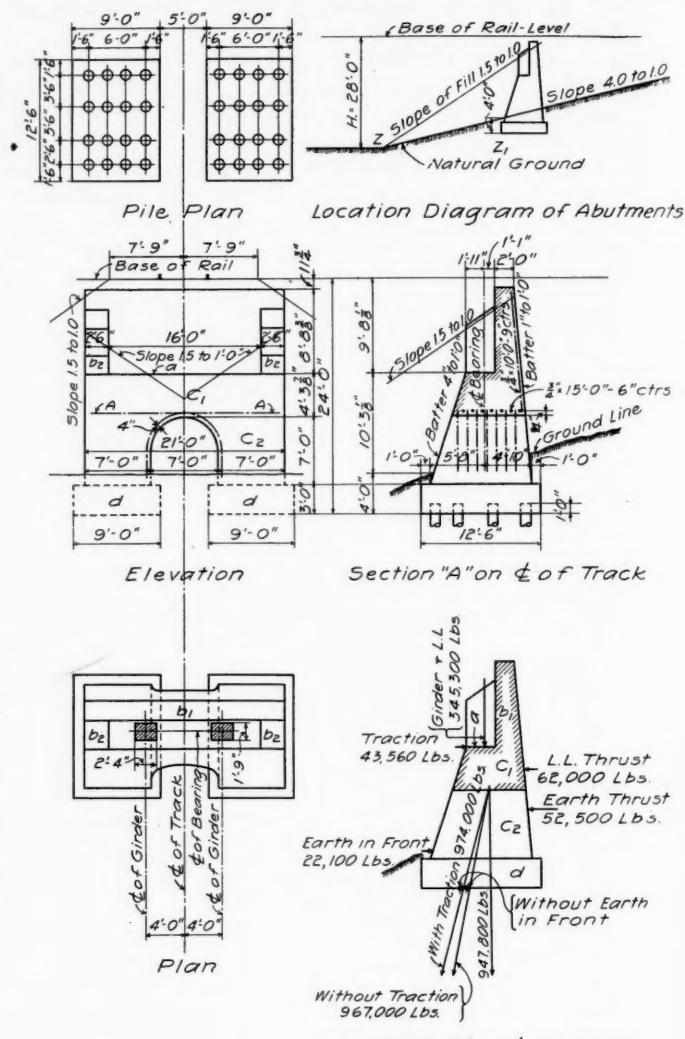


Fig. 4. Type B : Plain Concrete Pier Abutment

cept that the defect of that type, is the absence of bars in the back wall is eliminated.

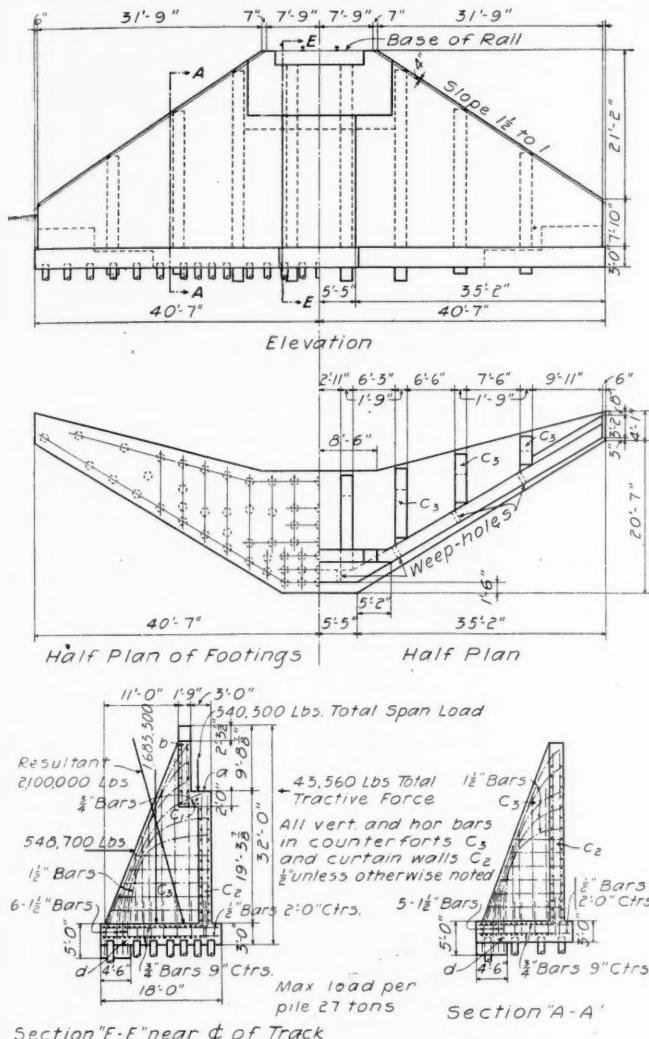
The two abutments are similar in other respects. The abutment type B₂, is a wing abutment built practically of plain concrete masonry. This type is by far the most widely used, and is an economical abutment for certain heights.

Abutments of this type do not cause the drainage water to wash away the corner of the bank adjacent to the back wall at x in Fig. 3, but at the lower point y on the bank, where the amount of the drainage water is greater, there seems to be a tendency to wash the portion of the bank adjacent to the end of the wing wall, and, therefore, this point is often found protected by loose rip-rap.

Type B₃. The U abutment of plain concrete masonry, type B₃, is shown in Fig. 11. This abutment is designed with the side walls, c_4 , long enough to provide for an embankment slope of $1\frac{1}{2}$ to 1, as experience shows that the slopes at the end of the embankment cannot be made much steeper than the side slopes of the same embankment. This lengthening of the side walls results in making the neatwork yardage for abutment B₃

greater than for abutment B_2 . This difference in yardage in the neatwork is overcome by the lower foundation costs of abutment B_3 so that the total cost of abutment B_3 is somewhat less than abutment B_2 for heights over 23 ft.

Type B_5 . An examination of section B, Fig. 3, shows that it is more difficult to make provision in an abutment to resist the lateral forces p_3 and p_4 tending to overturn the abutment than it is to take care of the vertical loads p_1 and p_2 . The lateral forces are exceeded in magnitude by the vertical forces, but



Section "E-E" near $\frac{1}{4}$ of Track

Fig. 5—Type C₁; Reinforced Concrete Counterfort Abutment.

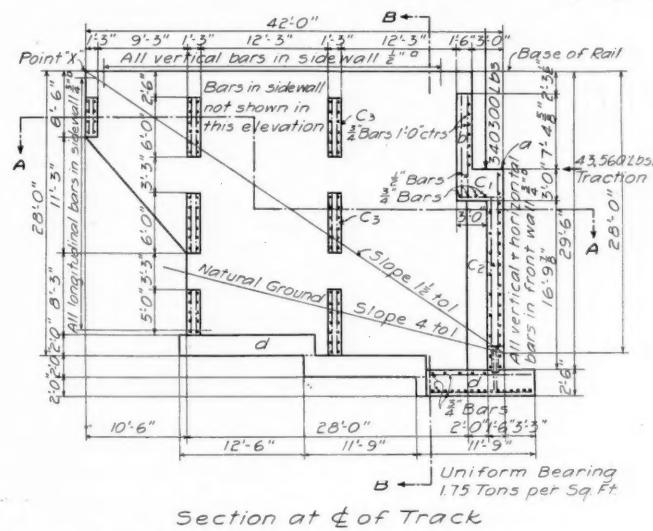
the vertical forces are directly opposed by the equal and opposite reaction on the foundation, whereas no such equal and opposite reaction can be placed on the line p_3 continued, which shows the direction and location of the lateral pressure of the earthwork. As a consequence it would seem that a considerable economy could be effected in a design in which the lateral forces p_3 and p_4 were eliminated or greatly diminished. In abutment B_5 , Fig. 4, little provision is made for resisting the lateral pressure of the earthwork. Instead, provision is made for diminishing the lateral pressure by omitting the wings and allowing the bank to spill around in front of the abutment. Abutment type B_5 consists, as shown in the elevation and Section B, of two short piers, which carry a beam $c-1$, the top of which forms the bridge seat a . The earthwork is kept off the bridge seat by the back wall b_1 , and the side walls b_2 . The bank is permitted to run around in front of the abutment to the point z where the natural slope of the fill intersects the ground line.

If an abutment type B_5 and an abutment type B_1 were so located as to have their bridge seats in the same position, the abutment B_5 would give a smaller waterway than the abutment

type B_1 by the distance from z to z_1 in Fig. 4, to which the fill extends in front of the abutment. In order to get the abutment B_5 on the same basis for comparison as the other abutments, it is necessary to add to the cost of abutment B_5 the cost of extending the superstructure so as to permit the location of the abutment to be moved from z to z_1 . As shown in the table herewith, this element of cost is an important item, amounting to 59 per cent. of the total.

REINFORCED CONCRETE ABUTMENTS.

Type C_1 . The reinforced concrete wing abutment type C_1 , shown in Fig. 5, is similar to the abutment type B_2 except that it is constructed of reinforced concrete instead of plain concrete. If the abutment is properly proportioned, the curtain wall c_2 can not be pushed outward by the lateral pressure of the earthwork without carrying with it the buttresses c_3 and without lifting the slab d from the pile foundations and also lifting the entire weight of the earth which rests vertically on the slab d . At the front of the abutment, the curtain wall c_2 is



Section at $\frac{1}{4}$ of Track

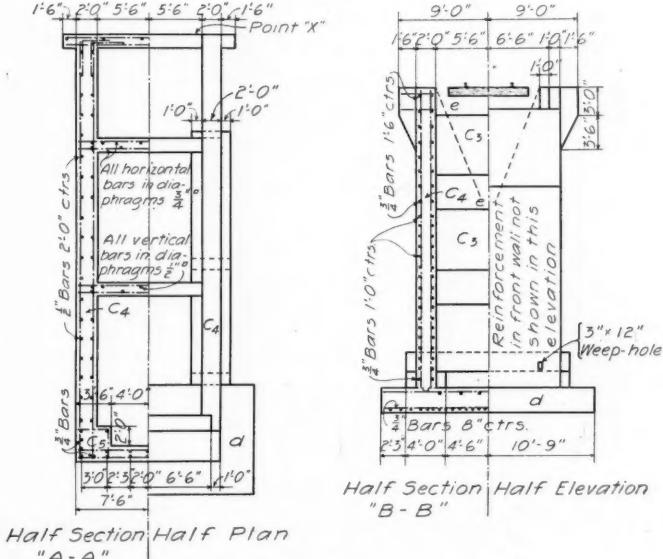


Fig. 6—Type C₂; Reinforced Concrete U Abutment Filled; Long Sidewalls.

given a horizontal offset c_1 as shown in section E-E to provide for the bridge seat a . The curtain wall is carried up vertically from the bridge seat a , forming the back wall b shown in the same section.

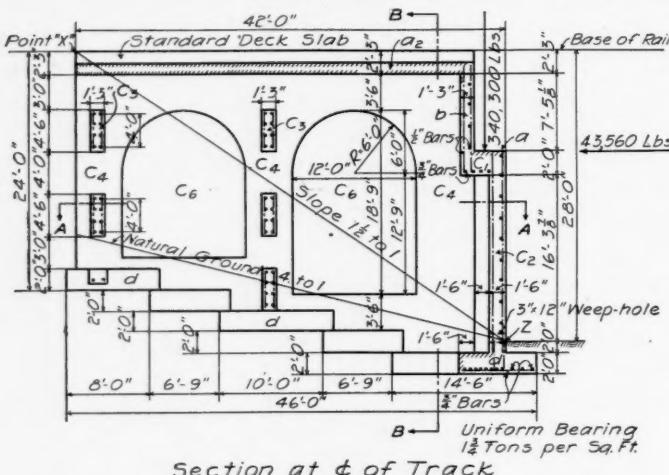
The abutment shown in Fig. 5 has no particular advantage over type B_2 , the introduction of buttresses not decreasing the cost of neatwork and the provisions for anchoring buttresses to the footings greatly increasing the cost of footings for fills

above 20 ft. Fig. 5 does not, however, show the best design that can be made of reinforced concrete wing abutment. It contains two defects; the bridge seat is set too far forward and the footings have insufficient projection in front of the neatwork.

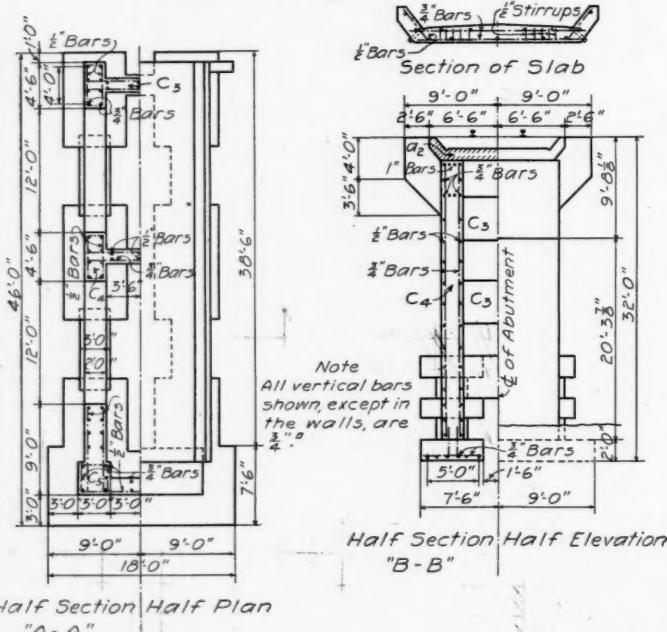
If these defects are corrected we have an improved and cheaper abutment. Estimates show that it costs about 10 per cent. less than type B₂ for the 36-ft. height and 25 per cent. less for the 50 ft. height which is outside the limits of the diagram.

If, in addition, the sections of all walls and buttresses are reduced to the minimum which can be placed by experienced workers under proper supervision, the economy over B₂ is still further increased.

Type C₂.—Abutment type C₂, Fig. 6, is a U abutment of reinforced concrete. It resembles the U abutment of plain con-



Section at $\frac{1}{4}$ of Track



Half Section Half Plan
'A-A'

Fig. 7—Type C₂; Reinforced Concrete U Abutment, Covered.

crete in external appearance. Structurally, however, it is quite different. It consists in plan of a rectangular box open at the top and at the embankment end, which is filled with earth. The track is directly supported on the earth filling. The sides of the box c₄ are prevented from being forced outward by the lateral pressure of the earth by ties c₅ which connect the two opposite sides c₄. The front of the box is the curtain wall c₂, which is a beam between the two side walls c₄, and restrains the lateral pressure of the earthwork in longitudinal direction.

This abutment easily satisfies requirements against overturning. The width of footings, measured along the center line of track, which is effective against overturning of type B₂, is 13 ft. 9 in.

That of type C₁ is 18 ft. The corresponding dimension on abutment C₂ is the distance from the front to back of abutment, or 45 ft.

It is true that the wing walls of abutments B₂ and C₁ protect, perhaps, five times as much of the embankment against scour as does abutment C₂, but if we compare the protection afforded

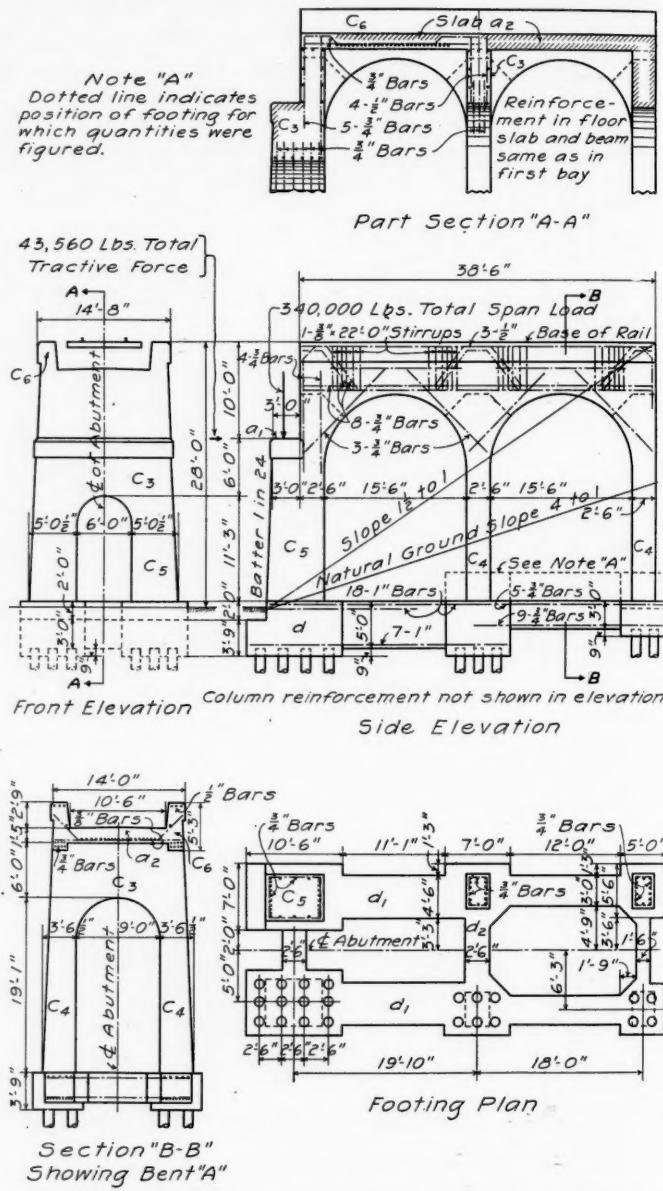


Fig. 8—Type C₃; Reinforced Concrete Arch Abutment.

by either type B₂ or C₂ with the total amount of bank protection required, the difference between the two abutments in this respect is not much. One of the defects of this abutment is that practically all of the surface water from the track for the entire length of abutment must drain past the point x, Fig. 6. As the amount of water is considerable, it tends to wash away the embankment at the end of the wing wall, which is, of course, an important matter, as the material is washed away at a point not far from the end of the track ties and requires much more attention than if the material was washed away at the end of the wing wall.

Type C₄.—Abutment type C₄, and all of the abutments which follow have one feature differing from any of the abutments previously mentioned, that of carrying the track directly on the body of the abutment over the entire length of the abutment instead of on the bank.

To save material and to equalize the pressure of the earthwork on both sides of the side walls c₄, two large openings c₆ are

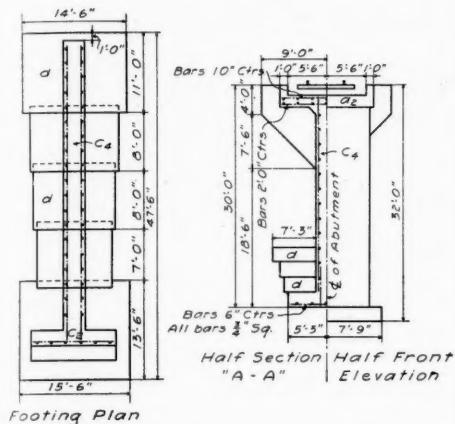
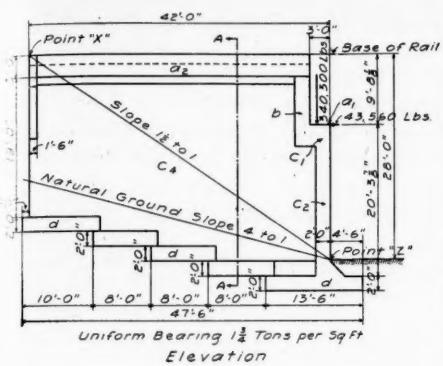


Fig. 10—Type C₆; Reinforced Concrete T Abutment.

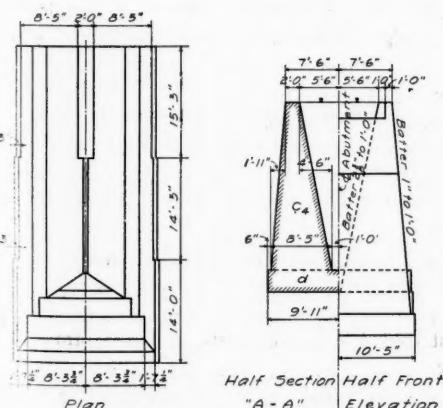
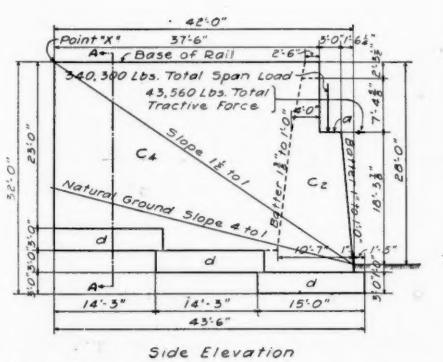


Fig. 11—Type B; Plain Concrete U Abutment, Filled.

| PLAIN CONCRETE MASONRY ABUTMENTS | |
|----------------------------------|-------------------------------------|
| Type B ₂ | Wing Abutment, Reinforced Backwall. |
| Type B ₃ | U-Abutment, Filled. |
| Type B ₅ | Pier Abutment. |
| Type B ₆ | Pier Abutment. |
| Type B ₇ | Pier Abutment. |
| Type B ₈ | Pocket Abutment. |

| REINFORCED CONCRETE MASONRY ABUTMENTS | |
|---------------------------------------|--------------------------------------|
| Type C ₁ | Counterfort Wing Abutment. |
| Type C ₂ | U-Abutment, Filled, Long sidewalls. |
| Type C ₃ | U-Abutment, Filled, Short sidewalls. |
| Type C ₄ | U-Abutment, Covered. |
| Type C ₅ | Arch Abutment. |
| Type C ₆ | T-Abutment. |
| Type C ₇ | Trestle Abutment. |

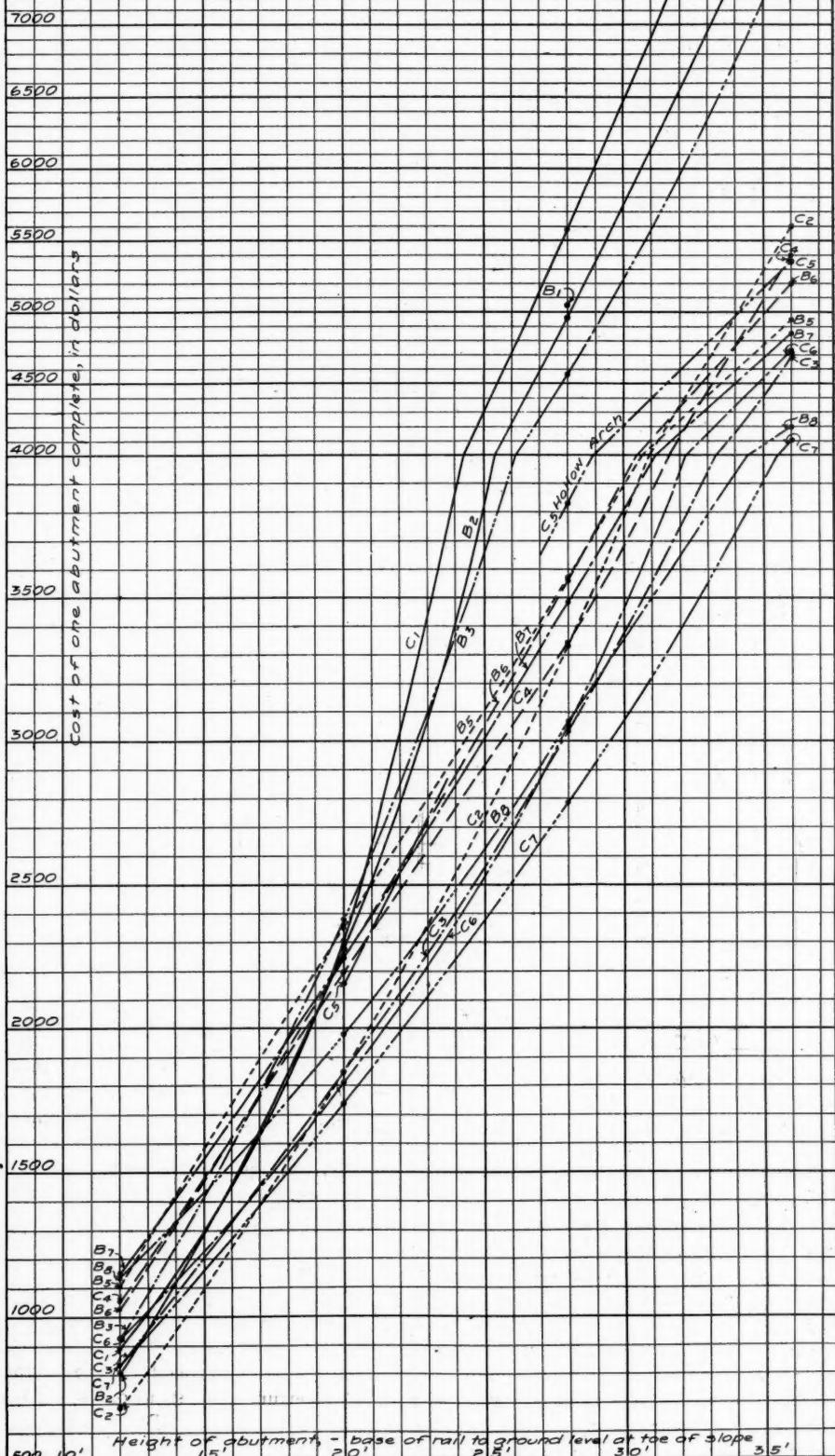


Fig. 9—Graphical Comparison of Costs.

made in the walls. The portion of the side wall remaining between the openings c_6 forms a column; and the portion of the side walls above the openings forms a beam between columns. The openings are shown circular on top, although structurally they could have been as easily made square.

Abutment C_4 has an advantage over abutment C_2 in that its foundation loads are less, due to the fact that the interior of the abutment is only partially filled with earth. The side walls of C_4 are subjected to practically no unbalanced lateral pressure of the earthwork. It has the disadvantage that it requires a considerable amount of material for the construction of the floor slab a_2 , and as a consequence it does not show much economy for low fills.

As there are practically no unbalanced lateral earthwork pressures in action against abutment C_4 no provision need be made to make it conform to the requirements m_1 , and m_2 and m_3 . This abutment gives, perhaps, slightly less protection to the embankment against scour than abutment C_2 , but it will probably not wash away at the shoulder of the embankment at x , as drainage for the top of the abutment is provided through holes in the sides of the floor slabs.

Type C₅.—Abutment type C_5 , consists in general of six vertical posts c_4 and c_5 , which support the slab a_2 . At the bottom they are tied together by the footings a_1 and d_2 . The footings d_1 and d_2 act partly as foundation beams and partly as ties, which hold the bottoms of columns in their true relative position and afford them support against any unbalanced lateral pressure of the earthwork. At the top the cross beam c_3 spans transversely between the posts c_4 . Two posts and the cross beam c_3 form a single bent.

At the top, also longitudinal beam c_6 spans longitudinally between the bents A . By this arrangement the slab a_2 is supported on four sides, the two ends of the slab resting on cross beams c_3 , and the two sides of the slab are supported by longitudinal beam c_6 .

At the front of the abutment the posts c_5 are made much heavier, as the beam c_3 which connects them together at the top carries the weight of the adjacent span of the superstructure, and also carries one end of a slab a_2 . The divisions mentioned are only those which have to be made in order to execute the design; the structure itself being tied together by steel in all directions so as to resemble a monolith. In service this abutment has all the advantages and disadvantages of type C_4 , which it resembles structurally in many respects. As it is somewhat more open than type C_4 , it drains itself a little better. The abutment shown in Fig. 8 is the design of W. S. Lacher.

Type C₆.—A T abutment of reinforced concrete type C_6 is shown in Fig. 10. The stem of this abutment consists of a slab a_2 , which is supported longitudinally along its center line by the central wall of the stem c_4 . The wall is carried vertically down to the spread footings d .

The floor a_2 with the wall c_4 are given lateral stability against overturning by the front curtain wall c_2 and by the reinforcement on both faces of the wall c_4 , which extends directly into the footings. The curtain wall c_2 is carried up to form the bridge seat c_1 and the back wall b in the same manner as in the C_4 abutments.

This abutment has the defect that it is not safe under a derailed locomotive. The derailed locomotive produces in this structure much greater stresses than in the other types. If we increase the reinforcement to take care of the exceptional case of a derailment, we need a quantity of steel nearly double that shown in the table, increasing the cost of reinforcing steel practically \$4,000 and filling the structure so full of bars that the cost of laying the concrete would be largely increased. Provision for derailment in this structure is, therefore, out of the question, and its weakness under a derailment must stand a grave defect.

Type C₇.—The trestle abutment type C_7 , in a general way is a concrete trestle of sufficient length to carry the track from the

point z , or from the end of the superstructure, to the point x , where the bank has attained its full height. Commencing at the top, this abutment consists of two standard U-shaped trestle slabs a_2 which contain the ballast, which in turn supports the ties and rails. These slabs rest on the neatwork of the bents c_2 and c_4 , which are ordinarily reinforced concrete trestle bents with spread footings d . To resist unbalanced longitudinal pressure of the earthwork, and also to add longitudinal stability to the abutment, the struts c_3 are introduced between the tops of the bents c_2 and c_4 , and the struts d_1 introduced between the bottoms of the same bents. In addition to acting as struts these members c_3 and d_1 combine the three bents and the two spans

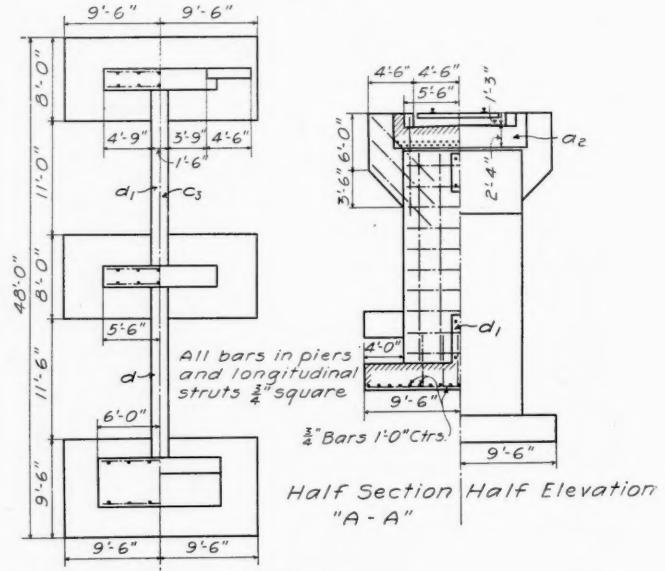
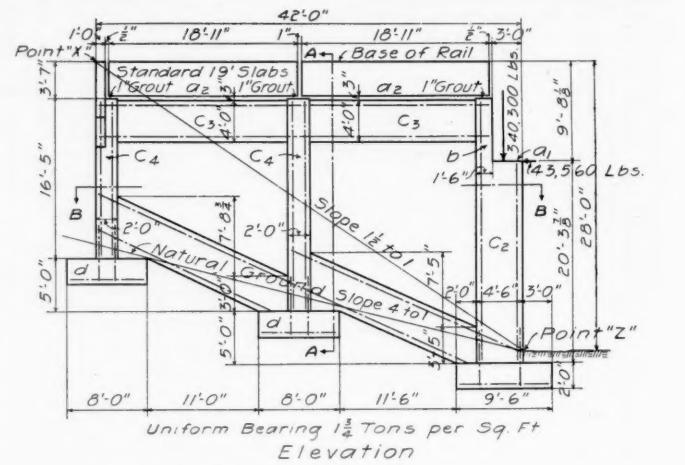


Fig. 12—Type C₅; Reinforced Concrete Trestle Abutment.

into two rigid quadrilaterals. The trestle bent c_2 at the front end of the abutment is made considerably thicker than the bents c_4 in the bank in order to leave room for the bridge seat a_1 . In service this abutment is much like C_4 and C_5 . Structurally it resembles C_4 more closely in that the floor a_2 is a separate member and can be placed after the abutment has been built. The remaining portion of the abutment forms a complete structure without the slab. The slab is only used to afford direct vertical support to the track.

MEMORANDUM ON TOTAL COSTS OF VARIOUS TYPES.

The table shows the manner in which the total estimated costs of the foregoing abutments were made up. This table should give dependable estimated costs, as the division of the total costs into their elements has been carried as far as could be conveniently done. It shows the quantities as well as the unit costs

and makes it possible for the reader to substitute different unit costs for those shown, where the conditions are such that the unit costs given in the table would not apply. It is not believed, however, that any ordinary changes will affect the relations between the totals.

In Fig. 9 the total cost of abutments are plotted as ordinates to the heights plotted as abscissas.

The objection most frequently made to abutments types C₂ to C₇ is their high cost, especially, it is said, if constructed by men experienced mostly in the construction of plain concrete work. On account of this objection the principal unit costs for this type were taken rather high, as it was believed that there was enough economy in the design of some of these types to more than offset the highest unit cost which could be

reasonably selected. Examination of Fig. 9 will show that this prediction was substantially correct.

In examining these cost curves, it is important that the following should be noted:

Types C₆ and C₇ are untried, and unexpected weaknesses may develop in their use. C₆ does not take care of derailment.

B_5 or C_7 cannot be used where much scour is anticipated or where the high water is near the bridge seat, without the use of rip-rap, whose cost has not been included.

It should be observed that the necessity of carrying the footings further below the ground will make a proportionately greater increased cost in types B₁ to B₅ than in types C₂ to C₇.

The use of any type of superstructure which gives a less depth of bridge seat below base of rail will mean a greater

TABLE SHOWING METHOD OF CALCULATING COST OF ABUTMENTS.

| Height in Ft. | Item. | Floor. | | Neatwork. | | | | Footings. | | | | Change in Length of Bridge one | | Engng. and Incidental Grand Total. | | | |
|-------------------|--------|----------|---------------------|-----------|----------|---------------------|----------|-----------|---------------------|----------|----------------------------|--------------------------------------|----------------------------|---|------------------|---------|---------|
| | | Cu. Yds. | Lbs. of of Conc. | Sq. Yds. | Cu. Yds. | Lbs. of of Conc. | Sq. Yds. | Cu. Yds. | Lbs. of of Conc. | Sq. Yds. | Cu. Yds. of Excavation. | Piles. | Cu. Yds. of Fill. work. | False- Abutment. | | | |
| B ₁ 28 | Quant. | ..... | ..... | 406 | ..... | 425 | ..... | 103 | ..... | 63 | 260 | 71 | 1,500 | ..... | 4.42 ft. (5%) | | |
| | Cost. | ..... | ..... | \$2,030 | ..... | \$510 | ..... | \$515 | ..... | \$76 | \$390 | \$568 | \$375 | \$50 | \$270 | \$239 | |
| B ₂ 12 | Quant. | ..... | ..... | 60 | 270 | 121 | 21 | 21 | ..... | 23 | 65 | ..... | 170 | ..... | .71 ft. (5%) | | |
| | Cost. | ..... | ..... | \$300 | ..... | \$9 | 145 | \$105 | ..... | \$28 | \$98 | ..... | \$43 | ..... | \$43 | \$38 | |
| 20 | Quant. | ..... | ..... | 160 | 270 | 220 | 56 | 56 | ..... | 49 | 120 | 34 | 600 | ..... | 2.79 ft. (5%) | | |
| | Cost. | ..... | ..... | \$800 | ..... | \$9 | 264 | \$280 | ..... | \$59 | \$180 | \$272 | \$150 | ..... | \$170 | \$109 | |
| 28 | Quant. | ..... | ..... | 387 | 270 | 420 | 102 | 102 | ..... | 60 | 260 | 64 | 1,500 | ..... | 6.04 ft. (5%) | | |
| | Cost. | ..... | ..... | \$1,935 | ..... | \$9 | 504 | \$510 | ..... | \$72 | \$390 | \$512 | \$375 | \$50 | \$368 | \$236 | |
| 36 | Quant. | ..... | ..... | 696 | 270 | 628 | 142 | 142 | ..... | 75 | 400 | 108 | 3,100 | ..... | 8.8 ft. (5%) | | |
| | Cost. | ..... | ..... | \$3,480 | ..... | \$9 | 754 | \$710 | ..... | \$90 | \$600 | \$864 | \$775 | \$50 | \$511 | \$392 | |
| B ₃ 12 | Quant. | ..... | ..... | 74 | ..... | 125 | 31 | ..... | ..... | 60 | ..... | 60 | ..... | ..... | ..... | (5%) | |
| | Cost. | ..... | ..... | \$370 | ..... | \$150 | 155 | ..... | ..... | \$90 | ..... | 15 | \$100 | ..... | \$44 | \$924 | |
| 20 | Quant. | ..... | ..... | 229 | ..... | 285 | 59 | ..... | ..... | 115 | ..... | 250 | ..... | ..... | .85 ft. (5%) | | |
| | Cost. | ..... | ..... | \$1,145 | ..... | \$342 | 295 | ..... | ..... | \$173 | ..... | \$63 | \$200 | \$52 | \$113 | \$2,383 | |
| 28 | Quant. | ..... | ..... | 496 | ..... | 450 | 103 | ..... | ..... | 210 | ..... | 325 | ..... | 1.52 ft. (5%) | | | |
| | Cost. | ..... | ..... | \$2,480 | ..... | \$540 | \$515 | ..... | ..... | \$315 | ..... | \$131 | \$300 | \$93 | \$219 | \$4,593 | |
| 36 | Quant. | ..... | ..... | 880 | ..... | 780 | 137 | ..... | ..... | 290 | ..... | 1,075 | ..... | 2.27 ft. (5%) | | | |
| | Cost. | ..... | ..... | \$4,400 | ..... | \$936 | \$685 | ..... | ..... | \$435 | ..... | \$269 | \$400 | \$139 | \$363 | \$7,627 | |
| B ₅ 12 | Quant. | ..... | ..... | 26 | 540 | 64 | 26 | ..... | ..... | 45 | ..... | 76 | ..... | 10 ft. | (5%) | | |
| | Cost. | ..... | ..... | \$130 | ..... | \$19 | 77 | \$130 | ..... | \$68 | ..... | \$19 | ..... | \$610 | \$53 | \$1,106 | |
| 20 | Quant. | ..... | ..... | 52 | 540 | 96 | 25 | ..... | ..... | 48 | 27 | 400 | ..... | 22 ft. | (5%) | | |
| | Cost. | ..... | ..... | \$260 | ..... | \$19 | 115 | \$125 | ..... | \$72 | 216 | \$100 | ..... | \$1,340 | \$112 | \$2,359 | |
| 28 | Quant. | ..... | ..... | 80 | 945 | 134 | 25 | ..... | ..... | 46 | 32 | 960 | ..... | 34 ft. | (5%) | | |
| | Cost. | ..... | ..... | \$400 | ..... | \$33 | 161 | \$125 | ..... | \$69 | 256 | \$240 | \$45 | \$2,075 | \$170 | \$3,574 | |
| 36 | Quant. | ..... | ..... | 103 | 945 | 172 | 36 | 550 | ..... | 68 | 45 | 1,860 | ..... | 46 ft. | (5%) | | |
| | Cost. | ..... | ..... | \$515 | ..... | \$33 | 206 | \$180 | ..... | \$102 | 360 | \$465 | \$60 | \$2,800 | \$237 | \$4,977 | |
| C ₁ 12 | Quant. | ..... | ..... | 38 | 680 | 120 | 24 | 700 | 32 | 79 | ..... | 171 | ..... | ..... | (12%) | | |
| | Cost. | ..... | ..... | \$247* | ..... | \$24 | 144 | \$156* | ..... | \$25 | \$38 | \$119 | ..... | \$43 | ..... | \$96 | |
| 20 | Quant. | ..... | ..... | 100 | 5,050 | 316 | 45 | 2,380 | 48 | 182 | ..... | 630 | ..... | ..... | (12%) | | |
| | Cost. | ..... | ..... | \$650* | ..... | \$177 | 379 | \$293* | ..... | \$58 | 273 | ..... | \$158 | ..... | \$249 | \$2,320 | |
| 28 | Quant. | ..... | ..... | 183 | 9,950 | 608 | 113 | 7,754 | 80 | 358 | 85 | 1,702 | ..... | ..... | (12%) | | |
| | Cost. | ..... | ..... | \$1,190* | ..... | \$348 | \$730 | \$735* | ..... | \$271 | \$96 | \$537 | \$680 | \$426 | \$602 | \$5,615 | |
| 36 | Quant. | ..... | ..... | 306 | 16,600 | 1,007 | 176 | 12,070 | 86 | 602 | 141 | 3,450 | ..... | ..... | (12%) | | |
| | Cost. | ..... | ..... | \$1,989* | ..... | \$581 | \$1,208 | \$1,144* | ..... | \$422 | \$103 | \$903 | \$1,128 | \$862 | ..... | \$1,001 | |
| C ₂ 12 | Quant. | ..... | ..... | 37 | 2,440 | 134 | 10 | 200 | 14 | 30 | ..... | 80 | ..... | ..... | (8%) | | |
| | Cost. | ..... | ..... | \$241* | ..... | \$85 | \$161 | \$50 | 7 | \$17 | \$45 | ..... | \$20 | \$10 | \$51 | \$687 | |
| 20 | Quant. | ..... | ..... | 102 | 6,730 | 349 | 20 | 900 | 34 | 65 | ..... | 300 | ..... | ..... | (8%) | | |
| | Cost. | ..... | ..... | \$663* | ..... | \$236 | \$419 | \$130* | ..... | \$32 | \$41 | \$98 | ..... | \$75 | \$20 | \$1,851 | |
| 28 | Quant. | ..... | ..... | 189 | 12,130 | 602 | 37 | 1,180 | 41 | 130 | ..... | 630 | ..... | ..... | (8%) | | |
| | Cost. | ..... | ..... | \$1,229* | ..... | \$425 | \$722 | \$241* | ..... | \$41 | \$49 | \$195 | ..... | \$158 | \$30 | \$247 | |
| 36 | Quant. | ..... | ..... | 304 | 20,000 | 1,015 | 42 | 840 | 74 | 140 | 54 | 1,200 | ..... | ..... | (8%) | | |
| | Cost. | ..... | ..... | \$1,976* | ..... | \$700 | \$1,218 | \$210 | 29 | \$89 | \$210 | \$432 | \$300 | ..... | \$416 | \$5,610 | |
| C ₄ 12 | Quant. | 8 | 2,180 | 48 | 31 | 1,950 | 25 | 99 | 16 | 400 | 24 | 60 | ..... | 70 | ..... | (10%) | |
| | Cost. | ..... | \$52* | \$76 | \$120* | \$202* | \$68 | \$63* | \$119 | \$80 | \$14 | \$29 | \$90 | ..... | \$18 | \$20 | |
| 20 | Quant. | 15 | 4,100 | 81 | 69 | 4,340 | 45 | 224 | 31 | 2,110 | 47 | 100 | ..... | 200 | ..... | (10%) | |
| | Cost. | ..... | \$98* | \$144 | \$203* | \$449* | \$152 | \$113* | \$269 | \$202* | \$74 | \$56 | \$150 | ..... | \$50 | \$40 | |
| 28 | Quant. | 21 | 5,370 | 115 | 114 | 7,180 | 100 | 298 | 41 | 2,790 | 65 | 130 | ..... | 550 | ..... | (10%) | |
| | Cost. | ..... | \$137* | \$201 | \$288* | \$741* | \$251 | \$250* | \$358 | \$267* | \$98 | \$78 | \$195 | ..... | \$138 | \$60 | |
| 36 | Quant. | 27 | 7,360 | 148 | 175 | 11,000 | 125 | 534 | 68 | 1,500 | 94 | 220 | 62 | 1,050 | ..... | (10%) | |
| | Cost. | ..... | \$176* | \$258 | \$370* | \$1,138* | \$385 | \$313* | \$641 | \$340 | \$53 | \$113 | \$330 | \$496 | \$262 | \$660 | |
| C ₅ 20 | Quant. | 30 | 2,740 | 80 | 49 | 2,668 | 130 | 48 | 2,373 | ..... | 67 | 26 | 239 | ..... | 2.2 ft. | (10%) | |
| | Cost. | ..... | \$195* | \$96 | \$96 | \$319* | \$93 | \$156 | \$312* | ..... | \$101 | \$208 | \$60 | \$100 | \$140 | \$196 | |
| 28 | Quant. | 48 | 5,250 | 135 | 90 | 6,873 | 250 | 84 | 7,198 | ..... | 130 | 44 | 550 | ..... | 0.5 ft. | (10%) | |
| | Cost. | | \$312* | \$184 | \$162 | \$585* | \$241 | \$300 | \$546* | \$252 | | \$195 | \$352 | \$138 | \$200 | \$350 | \$3,847 |
| 36 | Quant. | 51 | 5,296 | 140 | 125 | 8,922 | 345 | 113 | 9,852 | ..... | 145 | 52 | 1,050 | ..... | 8.0 ft. | (10%) | |
| | Cost. | | \$332* | \$185 | \$168 | \$813* | \$312 | \$414 | \$735* | \$345 | | \$218 | \$416 | \$262 | \$200 | \$490 | \$5,379 |
| 44 | Quant. | 81 | 7,781 | 200 | 234 | 15,165 | 570 | 153 | 12,254 | ..... | 244 | 80 | 1,912 | ..... | 5.2 ft. | (10%) | |
| | Cost. | | \$527* | \$272 | \$240 | \$1,521* | \$531 | \$684 | \$995* | \$429 | | \$366 | \$640 | \$478 | \$300 | \$320 | \$730 |
| C ₆ 12 | Quant. | 13 | 1,038 | 33 | 33 | 1,084 | 80 | 20 | 890 | 21 | 50 | ..... | 63 | ..... | ..... | (10%) | |
| | Cost. | | \$85* | \$36 | \$83* | \$215* | \$38 | \$96 | \$130* | \$31 | \$25 | \$75 | | \$16 | \$10 | \$84 | \$924 |
| 20 | Quant. | 23 | 1,835 | 58 | 72 | 2,365 | 177 | 33 | 2,000 | 37 | 83 | ..... | 224 | ..... | (10%) | | |
| | Cost. | | \$150* | \$64 | \$145* | \$468* | \$83 | \$212 | \$215* | \$70 | \$44 | \$125 | | \$56 | \$20 | \$165 | \$1,817 |
| 28 | Quant. | 33 | 2,633 | 84 | 133 | 4,371 | 301 | 50 | 5,066 | 52 | 130 | 467 | ..... | ..... | (10%) | | |
| | Cost. | | \$215* | \$92 | \$210* | \$865* | \$153 | \$361 | \$325* | \$177 | \$62 | \$195 | | \$117 | \$30 | \$280 | \$3,082 |
| 36 | Quant. | 43 | 3,430 | 108 | 208 | 6,840 | 471 | 82 | 8,320 | 82 | 200 | ..... | 1,100 | ..... | ..... | (10%) | |
| | Cost. | | \$280* | \$120 | \$270* | \$1,352* | \$239 | \$565 | \$533* | \$291 | \$98 | \$300 | | \$250 | \$30 | \$433 | \$4,761 |
| C ₇ 12 | Quant. | 12 | 2,960 | 54 | 24 | 910 | 76 | 14 | 250 | 18 | 40 | ..... | 60 | ..... | ..... | (8%) | |
| | Cost. | | \$78* | \$104 | \$135* | \$156* | \$32 | \$91 | \$70 | \$9 | \$22 | \$60 | | \$15 | | \$62 | \$834 |
| 20 | Quant. | 21 | 5,170 | 91 | 58 | 2,190 | 186 | 26 | 1,380 | 31 | 70 | ..... | 190 | ..... | ..... | (8%) | |
| | Cost. | | \$137* | \$181 | \$228* | \$377* | \$77 | \$223 | \$169* | \$48 | \$37 | \$105 | | \$48 | | \$130 | \$1,760 |
| 28 | Quant. | 41 | 10,100 | 129 | 87 | 3,290 | 283 | 36 | 1,910 | 37 | 100 | ..... | 500 | ..... | ..... | (8%) | |
| | Cost. | | \$267* | \$354 | \$323* | \$566* | \$115 | \$340 | \$234* | \$67 | \$44 | \$150 | | \$125 | | \$207 | \$2,792 |
| 36 | Quant. | 45 | 11,100 | 166 | 145 | 5,480 | 451 | 61 | 3,240 | 53 | 150 | 950 | ..... | ..... | ..... | (8%) | |
| | Cost. | | \$293* | \$389 | \$415* | \$943* | \$192 | \$541 | \$397* | \$113 | \$64 | \$225 | | \$238 | | \$305 | \$4,115 |

NOTE.—The unit prices used in calculating costs in the above table were as follows:

Concrete, \$5.00 per yard, except in cases where the total cost is marked with an asterisk (*), where \$6.50 per cu. yd. was used.

Steel, 3½ cents per pound.

Forms, \$1.20 per sq. yd., except in cases marked with an asterisk (*), where \$2.50 per sq. yd. was used.

Excavation, \$1.50 per cu. yd.
Piles \$8 each

Piles, \$8 each.
Fill 25 cents

Fill, 25 cents per cu. yd.

proportionate increase in cost in types B₁ to B₃ and C₆ than in types C₁ to C₃ and C₇.

Type C₁ is highest in cost of any abutment for heights over 21 ft. As previously mentioned, this type is created by the substitution of reinforced concrete in a mediocre design intended for plain concrete, making the least number of changes in the design which would permit the use of the new material.

If this design is improved, its cost can be reduced by an amount which will make it of less cost than type B₂ for heights above 28 ft. If advantage is taken of other known refinements in design of abutments of this character, its cost can be still further reduced.

For nearly all heights types C₃, C₆ and C₇ are the lowest in cost of those types in which the neatwork is carried to a sufficient depth to place footings on the natural ground.

CONCLUSION.

The writer finds that a general statement about the foregoing abutments has to be qualified in so many directions that it becomes merely a group of more or less disconnected facts.

Inspection, however, will show that the cheapest abutments for the higher fills, C₃, C₆ and C₇ are those in which no provision is made to restrain the lateral pressure of the earthwork, but where instead the earthwork is allowed to spill forward to its own natural slope.

As soon as departure is made from the gravity abutment, the greatest latitude is obtained for the ingenuity and skill of the designer. The types mentioned in this paper are only a few of the large number of abutment types which promise considerable economy.

As the minimum sections adopted are more liberal in the reinforced concrete abutments than in the plain abutments, it is probable that there is a wider margin for new economies in the reinforced than there is in the plain abutments.

FOREIGN RAILWAY NOTES.

At the end of 1910 the extent of railways in Cuba was 2,123 miles. This makes Cuba, in proportion to its size, one of the best served republics in the Americas in respect to railway transportation.

The extension of the Cairns Railway, Queensland, from Atherton to Evelyn, has been completed and opened to traffic. This line opens up splendid brush and forest country, and is the highest railway in the state. The average altitude for 20 miles is over 3,000 ft., and the highest point is 3,200 ft. above sea level.

A proposal is under consideration for a line to connect the Great Southern and the Southwestern railway systems in Western Australia at points near Mount Barker and Bridgeton. Between these places there is a vast area of cultivable country suitable for mixed agriculture and horticulture, and carrying very fine timber. This country is almost without a settler, although its development has been for many years a subject of ministerial promise. If carried out this work will greatly add to the trade of Albany as an exporting port.

The Longitudinal Railway is the plan toward which Chile is persistently devoting its energies. The peculiar contour of the country has hitherto confined communication largely to the coast line, except south of Santiago through the central valley, but the policy of the government is to develop means whereby the extreme north and the extreme south may be in touch with the center, altogether on land. Therefore it is extending this railway system as rapidly as possible. The distance from Arica in the north to Puerto Montt in the south is 2,132 miles, of which about 1,100 miles are in operation and 850 miles are under construction, while the remainder is being surveyed. The railways from the coast to the interior are chiefly private lines, serving special interests such as the nitrate fields, but the government controls the railway between Santiago and Valparaiso, and has purchased the Copiapo Railway.

TRAIN ACCIDENTS IN SEPTEMBER.¹

Following is a list of the most notable train accidents that occurred on the railways of the United States in the month of September, 1911. This record is based on accounts published in local daily newspapers, except in the case of accidents of such magnitude that it seems proper to write to the railway manager for details or for confirmation.

| Collisions. | | | | | | |
|-------------|-------------------------|--------------|-------------------|----------------|--------|--------|
| Date. | Road. | Place. | Kind of Accident. | Kind of Train. | Kil'd. | Inj'd. |
| *4. | L. S. & M. S. | Erie, Pa. | xc. | P. & F. | 3 | 13 |
| 7. | Central Ga. | Cedartown. | bc. | F. & F. | 0 | 1 |
| 14. | N. Y. Central | Albany. | xc. | P. & F. | 1 | 2 |
| *14. | N. Y. Central | Rice's. | rc. | F. & F. | 0 | 3 |
| 14. | N. Y., N. H. & H. | New Haven. | xc. | F. & F. | 1 | 0 |
| 14. | Atlantic C. L. | Quitsman. | bc. | P. & F. | 0 | 3 |
| 18. | Atlantic C. L. | Smithfield. | bc. | P. & F. | 1 | 0 |
| 20. | Boston & M. | Somersworth. | xc. | P. & F. | 0 | 3 |
| 21. | Mo. Pac.: A. T. & S. F. | Kansas City. | xc. | P. & P. | 1 | 20 |
| 22. | Southern | Atlanta. | bc. | P. & F. | 2 | 10 |
| 24. | Penn. | Larimer. | xc. | F. & P. | 1 | 5 |
| 27. | Wheeling & L. E. | Canton. | xc. | F. & P. | 2 | 12 |

| Derailments. | | | | | | |
|--------------|-----------------------|----------------|--------------------|----------------|--------|--------|
| Date. | Road. | Place. | Cause of derailmt. | Kind of Train. | Kil'd. | Inj'd. |
| 3. | Union Pac. | Kersey, Col. | acc. obst. | P. | 0 | 12 |
| 4. | Pere Marq. | Hard. | d. track. | P. | 1 | 4 |
| 5. | M., St. P. & S. S. M. | Fremont. | ms. | P. | 4 | 40 |
| 5. | Penn. | Mayport. | slide. | P. | 1 | 1 |
| 6. | Texas Mid. | Enloe. | unx. | F. | 1 | 2 |
| 7. | Wab., C. & West | Pinckneyville. | d. track. | P. | 0 | 14 |
| 8. | Southern | Anniston. | d. track. | P. | 0 | 0 |
| 7. | Atl. C. L. | Tennille. | d. engine. | F. | 0 | 3 |
| 7. | St. Louis & S. F. | Cordova. | unx. | F. | 1 | 2 |
| 10. | Mo., K. & Tex. | Brookshire. | unx. | F. | 2 | 0 |
| 10. | Sou. Pacific | Los Angeles. | st. car. | P. | | |
| 13. | L. E. & Pittsburgh | Cleveland. | d. track. | F. | 4 | 17 |
| 15. | Chi., R. I. & Pac. | Ainsworth. | unx. | P. | 0 | 3 |
| 17. | Chi., M. & St. Paul. | Monroe. | unx. | F. | 0 | 5 |
| 29. | L. S. & M. S. | Delray. | der. sw. | P. | 0 | 5 |
| | N. Y. C. & H. R. | Newark. | acc. obst. | P. | 0 | 1 |

The collision at Erie, Pa., on the 4th at about 9 p. m., was between a passenger train of the Pennsylvania and a freight of the Lake Shore, at the junction of the two roads, four miles west of the city. It is said that the passenger train had run past more than one block signal, and that steam had not been shut off when it struck the freight train. Both engines and many cars were wrecked, and the wreck took fire, and the bodies of the persons killed were pinned under the mass of wreckage.

The collision at Larimer, Pa., on the 24th, at about 1 a. m., was between the eastbound Pennsylvania special express train No. 28 and a westbound freight. At Larimer westbound freight trains regularly cross to the south side of the roadway preparatory to entering the yard at Pitcairn. Both trains were running slowly, but the fireman of the passenger train was killed by being caught between the engine and the tender. The engineman of the freight and the signalman in the tower appear to have been at fault.

The derailment at Kersey, Colo., on the 3d, was due to the displacement of a switch by a mail bag which fell violently against the switch stand when thrown out of the mail car of the train, and, according to the reports, the bag was thrown off at this place because the mail clerk saw a group of children standing at the place where he ordinarily threw it off, and who held it a few seconds until he had passed the station platform. The two rear cars of the train only were thrown off the track. Ten passengers were injured.

The derailment at Fremont, Wis., on the 5th, is said to have been due to the misplacement of a switch by a boy of fifteen years, the son of a former section foreman. According to the reports, the boy had a grudge against the road, because he had been refused a ride.

Miscellaneous.—Among the serious accidents on railways in September which do not appear in our table are a collision between a work train and a live-stock train on the Canadian Pa-

¹ Abbreviations and marks used in Accident List:
 xc, Rear collision—bc, Butting collision—xc, Other collisions—b,
 Broker—d, Defective—unf, Unforeseen obstruction—unx, Unex-
 plained—derail, Open derailing switch—ms, Misplaced switch—acc.
 obst., Accidental obstruction—malice, Malicious obstruction of track, etc.
 —boiler, Explosion of locomotive on road—fire, Cars burned while
 running—P. or Pass., Passenger train—F. or Ft., Freight train (includ-
 ing empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly
 destroyed by fire—Dagger, One or more passengers killed.

cific at Chapleau, Ont., on the 21st, in which seven drovers were killed, and the killing of thirteen persons at Neenah, Wis., on the 24th at a highway crossing. The seven men killed in the Canadian accident were sleeping in the caboose of the stock train. The persons killed at Neenah were members of a party of about thirty, riding in a hay-rack, which was struck by a train of the Chicago & Northwestern.

Electric Accidents.—Of the twelve accidents to electric cars reported in the newspapers as occurring in the United States in the month of September, only one is reported as resulting in fatal injury to the occupants of the car. This was a case at El Monte, Cal., where a car which became uncontrollable fell down a bank and against a train of the Southern Pacific, killing two persons and injuring eight. This case also appears in our table above, as the accounts indicate that the electric car caused the derailment of the locomotive of the Southern Pacific train.

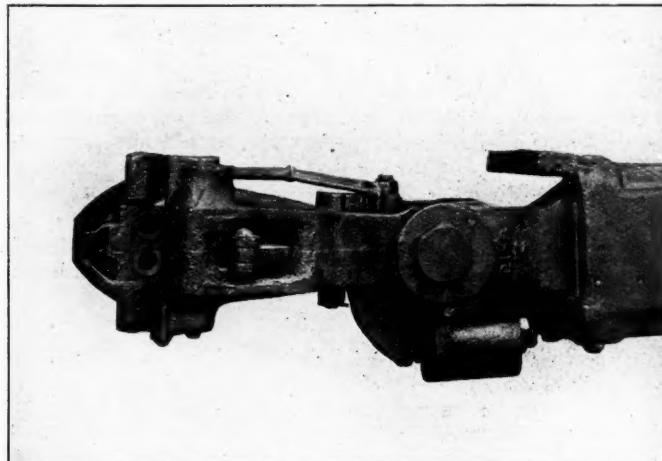
AUTOMATIC CAR AND AIR COUPLER.

In anticipation of the growing demand for economy in time and the safety of coupling cars, especially in the operation of rapid transit trains, the Westinghouse Air Brake Company, Pittsburgh, Pa., has designed a coupler which automatically connects both the drawbars and the air connections of two cars. This device is perfected and has been largely adopted by the Interborough Rapid Transit Company, New York. The coupler head consists of a solid body casting, which has a suitable hook and recess in its face to engage with the corresponding face of the other coupler. The heads are so designed that they will couple when 3 in. out of vertical alinement and 7 in. out of horizontal alinement. The couplers are held to the drawbar by a horizontal pin, which allows them to swing up or down, giving the necessary flexibility when passing over imperfections in the track. When uncoupled they are held in a horizontal plane by a spring located underneath the drawbar and pressing against the coupler.

The air connections run alongside of the drawbar and are connected to the coupler by a flexible hose, which is comparatively short in length and has no bends, thus eliminating any possibility of kinking. This hose is permanently connected and will wear for a longer time than the hose of the ordinary air connections. When coupled, the couplers are locked so

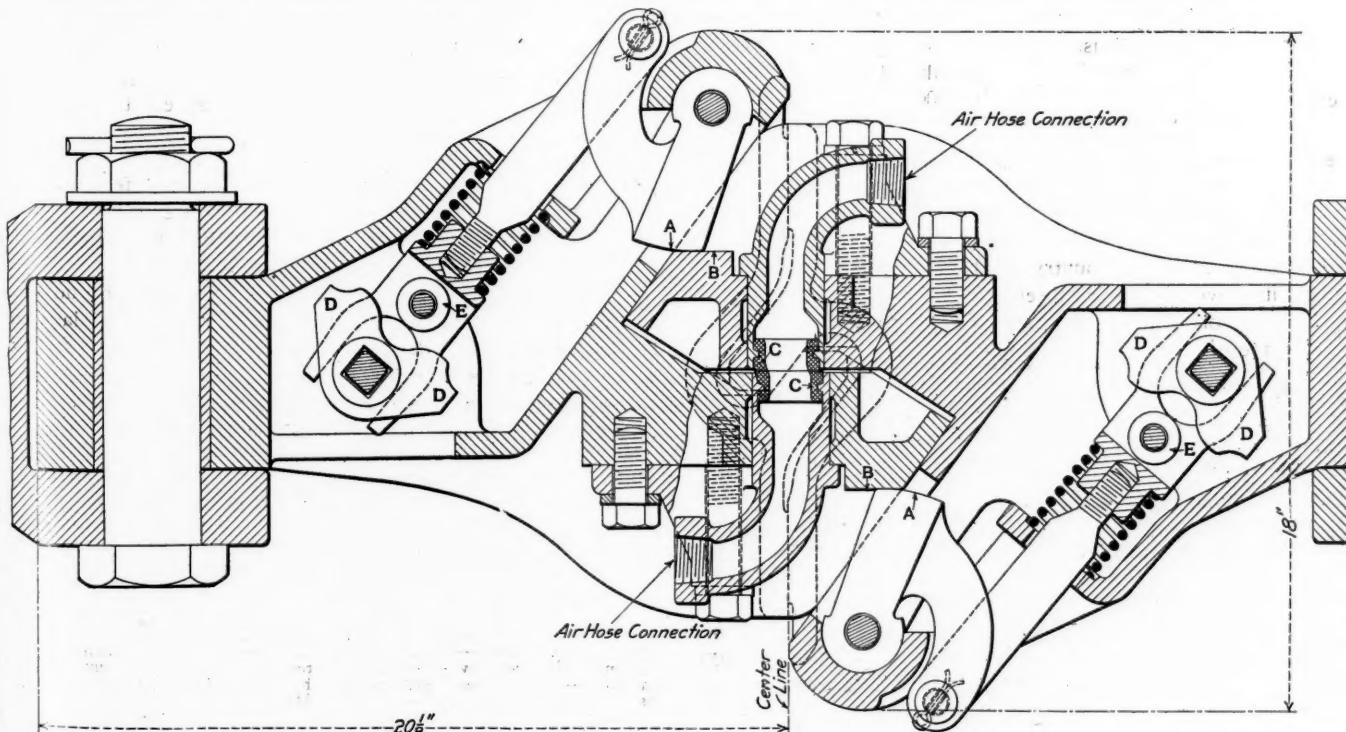
that there is no lost motion between them. This is accomplished by the type of lock used, which, as will be seen in the sectional illustration, automatically takes up the play as the couplers become more closely interlocked. In coupling the two heads slide into each other for about $1\frac{1}{2}$ in. in a direction about 40 degs. with the axis of the drawbar.

The face of the locking cam *A* engages with the machined surface *B* of the opposite coupler. In case one locking cam should be out of service, it will be seen that the other is sufficient to hold the connection. It will also be noticed that



Automatic Car and Air Coupler.

the air connection gaskets *C* come together in almost a perpendicular line, which prevents undue wear from abrasion. The locking cam is controlled by a lever on top of the drawbar, which operates the cam *D* through segmental gears. This cam, working on the pin *E* throws the locking cam in and out of service as desired. Both of these locking cams must be thrown out before the cars can be separated and after being uncoupled they can be thrown into the coupling position again, allowing the couplers to lock automatically. When the couplers are locked together they are as rigid as a single casting, thus providing a tight joint for the air connections.



Section of Coupler Heads, Coupled.

General News Section.

It was announced last week that the Cape Cod Canal would be finished in 1913. The canal, which will have no locks, will connect Cape Cod bay with Buzzards' bay by a wide channel 30 ft. deep at high water.

The report that the United States Steel Corporation had decided to terminate the lease of the Great Northern's ore property, mentioned last week on page 802, has been confirmed. The cancellation is to take effect January 1, 1915.

At Indianapolis, last week, W. R. Lawrence, a fireman on the Big Four, was arrested on a warrant issued on an indictment in the federal court at Cleveland, charging him with violating the law by obtaining a pass for himself and permitting others to use it. The penalty may be either a fine or imprisonment.

Shipping men in London are forming a steamship line to run from Sydney, N. S. W., to Valparaiso, Chile, with a view to utilizing the railway over the Andes between Chile and Argentina for a shorter route between Australia and England than is now possible. It is calculated that mails can be carried over this route in four days less than the time taken by way of San Francisco and New York.

The Southern Pacific, which has been carrying "first aid" kits on baggage cars, combination cars and cabooses, is now putting on each car a number of small kits, each containing only such bandages, etc., as are likely to be needed for the treatment of a single injury, instead of the large kits containing a number of bandages and dressings, which were formerly carried. When one of these large kits is opened and a part of the contents used, the remaining material loses its aseptic qualities.

The directors of the National Association of Manufacturers have passed the following resolution: "Whereas, The National Association of Manufacturers unqualifiedly stands for the equal enforcement of law; Be it resolved, That we demand the enforcement of the Sherman anti-trust law upon the restraint of trade practiced by labor unionism, which already stands convicted before the Supreme Court of the United States, with the same vigor as corporations and individuals are now being prosecuted under that law."

Returns to the Bureau of Labor Statistics of New York State from 190 representative trade unions, with 120,000 members, as to idleness during the first half of the year 1911, indicate a smaller demand for labor than any other recent year except 1908. The mean percentage of members reported idle at the close of each month was 24.8 this year, as compared with 19.2 last year and 22.3 in 1909. In 1908, when the business depression was at its worst, the mean percentage was 34.7, the highest on record since 1901. But from 1902 to 1907 the mean for the first half of the year was below 20 in every year except 1904, when it was 20.2.

A train laden with two million dollars' worth of silk recently ran from Seattle to New York City, 3,178 miles in 82 hrs. 15 min. The route was via the Great Northern, the Burlington and the New York Central. This means that the train traveled at an average speed, counting stops, including a delay of more than two hours in switching at Chicago, of more than 38½ miles per hour all the way across the continent. The train left Seattle on Friday, October 13, at 4:45 a. m., and reached St. Paul at 4 a. m. Sunday. It arrived at Chicago at 2:05 p. m., having traversed the intervening 431 miles in 9 hrs. 45 min. Leaving Chicago at 4:30 p. m. Sunday, it arrived in New York City at 6 p. m. Monday.

The committee on local transportation of the City Club of Chicago has presented a report to the committee on local transportation of the city council on street car service to Chicago railway stations. The report characterizes the service afforded as probably the worst in the country. Chicago has six central terminals, serving 24 roads, and, with one exception, no two stations are connected by a surface car line. Three alternate methods of connecting the stations are suggested in the report: A shuttle system, a belt line, and through routing in connection with existing transportation lines. The report estimates the cost of changes necessary to establish through routes connecting all stations at not less than \$100,000.

The Indiana railway commission has ordered the Lake Erie & Western to install automatic block signals between Templeton and Lafayette, 19 miles, as soon as the installation can be made. The order also requires a manual block system between Indianapolis and Kokomo, 54 miles, until the matter of double track is determined, when automatic signals may be installed instead. Other parts of the line maintain manual block where the density of traffic requires it. The Grand Trunk has agreed to comply with the Indiana railway commission's order requiring automatic block signals on its single track line in Indiana, and controlled manual block on the rest of its 90 miles of line in the state.

The New York Central, which is credited with having been the first road to use selector calling apparatus on a telephone line for train despatchers, has established 12 additional despatchers' circuits and has received 249 selector box outfits from the United States Electric Company of New York City. These selectors are of the Gill bridging design and the signal bells are run by the main line battery. The Baltimore & Ohio, which also uses the Gill design, has ordered from the United States Electric Co. 96 selector box outfits, one half of which are to be used on message circuits. On these message circuits the inter-calling system is to be used, by which one way-station may call another without the intervention of the main despatcher's office.

Old-Time Railroading in Missouri.

Once I was called at Holden to take out a train of 12 cars of stock that was coming from Kansas City. It was midnight and raining very hard. I called my three brakemen who were sleeping in the caboose. We had not been off the road more than four hours: They got up and saw what a terrible night it was and refused to go out. I told them to get their things out of the caboose, that I was going out if I had to go alone. They left the caboose and went to the depot. The train arrived. As I was going along the train getting the numbers, I found a man standing between two of the stock cars. I said, "Hello, my friend. What are you doing there?" He said, "I am trying to get to St. Louis." "Have you not got money enough to pay your way on a passenger train?" I asked. Said he: "My God, man, if I had a cent, do you think I would be standing here in this rain?" I knew I was going to be alone. This man would be company if no help, so I told him to go back in the caboose. He did so. I started alone with my train. I told the engineer he might have to reverse his engine to help stop. His name was Pat Grace. He said: "All right." When we got to Post Oak, two and one-half miles west of Warrensburg, and at the foot of Centreville Hill, I think we were going 40 miles an hour. We ran until we struck Warrensburg Hill and the train stopped itself. Then we backed up a mile, took water and went ahead. We had the old open top stock cars with a single running board; and brakes not the best. I learned from this man that he used to be a brakeman on the Philadelphia & Reading. After daylight he helped me stop the train and I arrived in Jefferson City with my 12 cars of stock. I kept this man as one of my brakemen.

At another time I had an experience with a train of cattle, Texas steers, in cars with open tops and a running board one foot wide to walk on. If the train was running 15 miles or more per hour you could not go across these cars on a walk, you had to run. If not, you would fall in. I wanted to get over on the engine leaving Warrensburg, so I started across the top of the train going down the hill. The train was running fast. I mis-calculated my steps and fell in the car on the backs of the cattle. I lost my book of waybills in the car. I scrambled out on top of the running board and when going up Knobnoster Hill I went over to the engine and told the engineer we would stop and unload the cattle to get my waybills, load up the cattle and go ahead. I thought I could do this in 30 minutes. Well, we were just three hours. I did not know Texas steers as well then as I did afterwards, as I had never seen any except in cars. As soon as we got the cars to the chutes and opened the door, out they rushed and commenced charging the fence to break out. If you got on the fence they would charge at you. I was told by a stock-

man there that the only way I could load them again would be on a horse. I went to a livery stable in town, got two men and horses, loaded the steers, then paid the men \$5 for doing so. If the steers had ever broken out of that stock yard I should have been paying for them yet or else had to go to Texas after them, for I never saw an animal so wild. Early day conductors and stockmen will agree with me. They were afraid of nothing except a cowboy on a horse.—J. K. Merrifield, in *Missouri Pacific Agent's Bulletin*.

Santa Fe Demonstration Train.

As mentioned in the *Railway Age Gazette* of June 9 and September 22, the Atchison, Topeka & Santa Fe has been operating over a portion of its eastern and western lines a demonstration train, illustrating the progress made in railway equipment and roadbed construction during the last 30 years. The accompanying photograph shows the train as it appeared while making its run. It was on the road four weeks. The train made stops at all towns of importance, and officers of the road who accompanied it explained the exhibits to the crowds who gathered to see them. The exhibit created a great deal of interest wherever it was shown, and the educational features of the train were commented on freely by newspapers throughout the states covered. A number of officers of the lines not covered have requested that the train be run through their territory, and it is possible that further use will be made of it. The train is pulled by engine No. 3,009, a hybrid Mallet reconstructed from two decapod locomotives in the company shops at Topeka. This locomotive, which is the largest in the world, was described in the *Railway Age Gazette* of April 14, 1911, page 906. Just

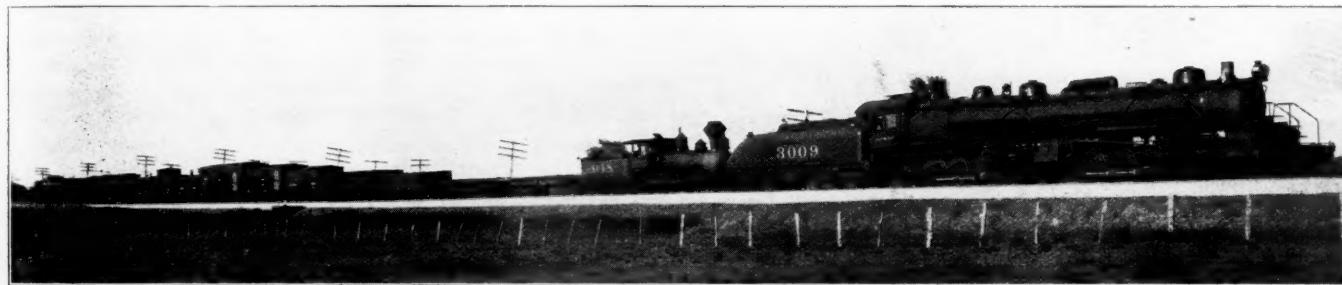
legitimately, and as the result of better and more commodious service. If it is only secured by the sacrifice of the largest section of the public to a portion politically more useful, the surplus is costing more than it is worth. . . . The farmer in remote districts needs his mail, and deserves to get it regularly. It is, however, not an indispensable part of his business; while the punctual delivery of mail in the towns is essential to the prosperity of the country, without which the farmer would find a mighty poor market for his produce.

Mr. Hitchcock, however, plays up to, or down to, the farmer's vote, at the expense of the cities. Rural free delivery is not curtailed, but the number of letter carriers, already inadequate, in one section of Greater New York is reduced from 47 to 29.

We have no better public servant than the railway postal clerk. In cars which should contain five men three are now asked to do the work, with the result that mail matter overruns its destination, and the largest cities in the Union are thereby grossly ill served.—*Wall Street Journal*.

Railway Nationalization in Great Britain.

Among other results of the railway strikes has been a busy revival of the demand for nationalization. The advocates of that policy have found the opportunity to their hand and made the most of it. The trade union congress voted an instruction to the parliamentary committee to promote a bill for the nationalization of railways and canals next year. This demand has for many years been a regular item in socialist and labor-socialist programmes; but circumstances this year have given it more point and substance than it could hitherto claim. It is not a chimerical demand. Railways are one of those public services which have



Santa Fe Demonstration Train.

behind the Mallet is engine No. 048, built in 1880. The other equipment in the train includes flat cars, coal cars, stock cars, box cars, way cars, smokers and coaches. In each case a modern car and one of the type used 30 years ago being coupled together. In addition to the engines and cars, a number of smaller exhibits were shown on the flat cars, such as couplers, draft rigging, brakes and other equipment appliances, and comparative sections of roadbed and comparative signal installations illustrating the difference in practice between 1881 and 1911. The train was in charge of E. B. Sill, the oldest conductor on the road, who has been in service 33 years. The small locomotive was in charge of Peter Tellin, the oldest engineman on the road, who has been in service 39 years. Frank McClure, who was born the year the small engine was built, was in charge of the Mallet. The following table shows comparisons between the old and new equipment used in the train:

| | Relative Weight. | | Relative Capacity. | | Relative Cost. | |
|--------------|------------------|----------------|--------------------|----------------|----------------|----------------|
| | Old Equipment. | New Equipment. | Old Equipment. | New Equipment. | Old Equipment. | New Equipment. |
| Locomotive. | 133,000 lbs. | 850,000 lbs. | 14,000 lbs. | 110,000 lbs. | \$7,740 | \$43,880 |
| | | | (Drawbar pull) | (Drawbar pull) | | |
| Flat car.... | 19,200 lbs. | 32,100 lbs. | 40,000 lbs. | 80,000 lbs. | 300 | 943 |
| Con. car.... | 22,000 lbs. | 36,500 lbs. | 50,000 lbs. | 80,000 lbs. | 338 | 1,036 |
| Box car.... | 22,600 lbs. | 46,900 lbs. | 40,000 lbs. | 80,000 lbs. | 475 | 1,265 |
| Way car.... | 23,800 lbs. | 38,000 lbs. | ..... | ..... | 620 | 1,282 |
| Smoker.... | 49,400 lbs. | 119,100 lbs. | 28 pass'gers | 86 pass'gers | 3,000 | 12,124 |
| Coach | 50,300 lbs. | 123,100 lbs. | 48 pass'gers | 75 pass'gers | 3,605 | 12,820 |

Politics and the Postoffice.

No more pertinent nor appropriate example to other departments of the government than the conversion of a post office deficit, reported year after year, into a surplus, could be desired. . . . The surplus, however, should be one obtained

been transferred from private enterprise to the state in many countries, and they may conceivably be so treated here. Indeed, provision was made by Parliament, in 1844, as to the terms upon which the transfer might be made.

Some well informed authorities on railway matters, who do not desire the change and do not see any advantage in it, nevertheless believe it to be inevitable, because the conditions under which the business is carried on have gradually become more and more onerous and tend eventually to make it impossible as a commercial concern. What with increasing statutory restrictions, government control, public demands for more facilities and lower charges, rising demands of labor, stoppages by strikes, and growing burdens of taxation without representation, the railways have lost irretrievably the commercial position they once held, and find it more and more difficult to live and thrive.

From this point of view the recent and present troubles constitute a real crisis, the significance of which seems hardly to be grasped by those who advocate nationalization on theoretical grounds. The railway companies have gone into the inquiry by royal commission on the understanding that they may be allowed to raise their charges if the result is such as to compel that step. This means that in the opinion of those who manage them the strain has reached such a point that, if it is increased on one side it must be relaxed on another. If, for instance, wages are raised, the public must be prepared to pay more, and to that attitude the government has assented.

Now there is evidently a vital difference between the negative view that railways cannot be much longer carried on under conditions which are thus seen to be reached, or nearly reached, the point of incompatibility, and the positive view that they ought to be nationalized in the public interest. The latter rests on the assumption that the public would gain by the change. Those who

advocate it hold that the present pass is due either to private ownership in itself, which is the pure socialist argument, or to bad management, which is a half socialist one; and they assume that nationalization would cure all the existing troubles. They believe—we must presume seriously—that state ownership and management would at the same time give the public better facilities at lower rates, pay higher wages and grant better conditions to railway servants, abolish discontent, and make strikes impossible.

These contentions are constantly put forward, though not altogether. The last is the point chiefly emphasized by recent experience. The railway companies, it is said, have shown that they cannot manage the business, and therefore it must be taken from them. The tacit assumption is that no such trouble would then occur. This is merely a pious belief, which is contradicted by experience, and by express declarations made on behalf of the men. The assumed immunity from discontent and strikes conferred by state ownership has been disproved in several countries, but in the clearest manner in France, which offers a particularly favorable opportunity of comparing private and public ownership under the same conditions. Comparison of one country which has state ownership with another which has not may be open to objection, because of the difference in other conditions; but, when both systems are found operating in the same country, a valid comparison can be made.

That is the case in France. Of the five great trunk lines radiating from Paris, one, the Western, has been taken over by the state. Was it spared in the great railway strike of last year? Quite the contrary. The trouble was rather worse on that line than on the others, and much worse than on three of them. It was more acute, more obstinate, and accompanied by more acts of violence; and, to speak generally, discontent among the railwaymen appears to be more chronic on that line.—*London Times*.

Canadian Pacific Dining Cars.

At Winnipeg, Calgary and Vancouver the Canadian Pacific in connection with the dining car department has in use three new buildings which have been erected at a cost of \$15,000 for lodgings for the employees of the dining car department. Coming into these cities after a long run the men will not have to look up a hotel or boarding house, but will go to the new buildings. These houses are built to accommodate sixty-two employees and are of the most modern construction in every respect. Everything is free, including the laundry. Conductors, chefs and waiters all have separate quarters, and these quarters include baths, bedrooms, reading rooms, libraries, cardrooms and billiard rooms. Nice gardens beautify the premises and the men have all the comforts of home. The men will always be clean and tidy. It is compulsory for the men to take a bath and a change of underwear after each trip. A check system has been installed which makes it necessary for the men to comply with this rule. When a car is called away on short notice at night it is not necessary to seek for a crew. The men are right at hand when needed. It is expected that the C. P. R. will build these houses at all divisional points, and one is now projected for Moose Jaw.

Harriman Lines Strike.

The embargo notice of the Illinois Central advising railways connecting with it that no freight from them would be received by that road for delivery at Memphis and New Orleans, because of the possible violence of the strikers has been withdrawn, indicating the improvement in traffic conditions on that road. Officers of the road in Chicago said there was no truth in the statements of striking shop men that incompetent inspectors were looking after safety devices and air brake equipment.

A special committee appointed by Mayor Harrison of Chicago, on protest of the striking shop men has recommended that the Illinois Central pay for the services of 72 policemen detailed to protect the property of the company, it being alleged that the policemen were stationed inside the fences, and that they performed the duties of private watchmen. The same committee recommended that the Chicago health department investigate conditions at the railway's paint shop, where strike breakers are housed.

Representatives of the shop men say that some 3,000 shop workers on the Central of Georgia will go out on a strike in sympathy with members of their union on the Illinois Central.

Reports from Galveston, Tex., say that members of the Brotherhood of Railway Trainmen and of the Order of Railway Conductors employed on the Harriman lines have voted to strike; also, that strike votes are being taken on the Harriman lines by members of the Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen, and the Order of Railway Telegraphers.

Reports that shop employees of the Rock Island lines were about to go out in sympathy with their co-workers on the Illinois Central were discredited by officers of those lines.

Iron and Steel Production in 1910.

The report on the production of iron ore, pig iron and steel in 1910, published by the Geological Survey, says in part: "Although the iron and steel industry in the United States in 1910 broke all previous records by a small margin, the total volume of business was not as great as was anticipated at the beginning of the year. On December 31, 1910, there were 205 furnaces in blast out of a total of 473; on the same date in 1909, there were 338 furnaces in blast out of a total of 469. As a consequence of the active demand, the iron ore output exceeded that of 1909 by 5,734,297 long tons, and that of 1907, which was previously the record year, by 5,169,115 tons. The total quantity of iron ore marketed in 1910 for the purpose of making pig iron (not including stocks left at mines or iron ore used for fluxing other metallic ores, nor in the manufacture of paints, was 56,889,734 long tons, as compared with 51,155,437 tons in 1909, and with 35,924,771 tons in 1908. The output of pig iron in 1910 was 27,303,567 long tons, as compared with 25,795,471 tons in 1909 and with 15,936,018 tons in 1908. The increase in the production of iron ore in 1910 over that of 1909 was 11.21 per cent., and the increase in the production of pig iron and steel was 5.85 per cent. and 8.93 per cent., respectively."

British Report on Labor Controversy.

The British commission appointed last August to try to settle the questions at issue between the railway companies and their employees has issued its report. The commissioners feel that recognition by the companies of the men's unions is not desirable. It says that the companies, with their great responsibilities, cannot and should not be expected to permit any interference by their men on the subjects of discipline and management.

The commission recommends the adoption of a new scheme, to be in force until January 6, 1914, by which all questions affecting hours of work, wages and conditions of service that cannot be settled by negotiation shall be referred to a conciliation board to be formed along the lines of the existing sectional boards of conciliation. It is proposed also that the existing agreements between the companies and the men shall remain in force until January 7, 1912. The commissioners recommend, in conclusion, that men on strike shall not be allowed to coerce by threats or intimidation other men who wish to work.

After the report was made public, meetings were held by a number of unions, and resolutions refusing to accept the commission's findings were passed. When the commission was appointed the Board of Trade announced that both parties had promised to accept the findings. Several labor leaders now say that neither the men nor the union executives were consulted, that acceptance was not pledged, and that they will not recognize such an obligation.

Government Regulations of Industrials.

At a speech in Brooklyn last Tuesday, Interstate Commerce Commissioner Prouty advocated the appointment of a commission to regulate industrials. He said:

"There is no greater joke to-day than the treatment of the trust problem by the government of the United States. For more than twenty years the Sherman anti-trust law has been the subject of judicial interpretation, and yet to-day no lawyer can advise his client with certainty whether he is within or without the inhibition of that law.

"The U. S. Steel Corporation is profoundly uncertain whether its enterprises are legal or not. If there are evils connected with the organization or operation of monopolies—and there are very grave evils—they must be reached by some method different from dissolution decrees. Drastic regulation by a trust commission could meet the difficulty.

"I believe the only practical relief from trust oppression is to be found in more direct and drastic government regulation. First a commission should be appointed, in most respects similar to the Interstate Commerce Commission. It should devote considerable time to investigation before taking action. That was what the Interstate Commerce Commission did before it began to exercise real power. The time will not be wasted.

"Just as in the case of the railways, the way to regulate industrial monopolies is for the government to take hold and regulate them itself."

Employers' Liability Legislation.

The joint congressional commission on employers' liability, which has been holding meetings in Washington to formulate a bill to be presented at the next session of Congress, has agreed on the main points. It is to apply only to interstate carriers, on the ground that this is as far as the power of Congress extends. The compensation is to be paid by the employer directly and not out of a general fund created by any form of taxation. The law is to be compulsory, except that if any company and its employees agree on a plan of compensation which is as favorable to the employees as is the law, this plan may be substituted for the law. The amounts of payments are to be based on a percentage of the pay received by the injured employee at the time of his injury. Public hearings are to begin on November 6 in Washington.

M. M. and M. C. B. Conventions.

At a joint meeting of the executive committees of the Master Mechanics', Master Car Builders' and Railway Supply Manufacturers' Association, held at the Belmont Hotel, New York, October 24, it was decided to hold the 1912 conventions at Atlantic City. The Master Mechanics' Association will meet June 12, 13 and 14, and the Master Car Builders' Association, June 17, 18 and 19. At the suggestion of railway men it was decided to make a change in the entertainment features and the manner of handling them.

Dining Car Superintendents.

The American Association of Dining Car Superintendents at its meeting at Cincinnati, Ohio, last week, elected the following officers: President, George L. Best (Southern); vice-president, A. D. Gilleland (Colorado & Southern); secretary and treasurer, F. M. Dow (Illinois Central), Chicago; executive committee, P. A. Danzer (Denver & Rio Grande), G. M. Hart (Wabash), and E. W. Smith (Grand Trunk). The next convention will be held in October, 1912, at Denver, Colo.

The American Railway Association.

The fall session of the American Railway Association will be held at the Blackstone, Chicago, November 15. Reports will be presented by the committees on Transportation, on Maintenance, on Relations Between Railways, on Explosives, and on Electrical Working.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York; next convention, Seattle, Wash.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew building, Cincinnati, Ohio; 3d Friday of March and September.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York; November 15, Chicago.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next annual convention, third week in October, 1912, Baltimore, Md.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, Monadnock Block, Chicago; annual convention, March 19-21, 1912, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Annual convention, Atlantic City, N. J., June 12-14.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—O. T. Harroun, Bloomington, Ill.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wemlinger, 13 Park Row, New York; 3d Tuesday of each month, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; annual, June 26, 1912, Quebec, Que.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; annual convention, May 22, 1912, Los Angeles, Cal.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago; annual, November 6-10, Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; annual, June 24, 1912, New York.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York; December 12-13, Louisville, Ky.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—D. F. Jurgensen, 116 Winter St., St. Paul, Minn.; 2d Monday, except June, July and Aug., St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesdays, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va.; annual May 15, Buffalo, N. Y.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio.

IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August, Des Moines.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Annual convention, Atlantic City, N. J., June 17-19.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION, OF UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next annual convention, second week in September, 1912.

NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.

NORTHERN RAILWAY CLUB.—C. L. Kennedy, C., M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

OMAHA RAILWAY CLUB.—H. H. Maulick, Barker Block, Omaha, Neb.; second Wednesday.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—C. W. Alleman, P. & L. E., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; annual, May 12, 1912, Kansas City, Mo.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling; Sept. 10, 1912, Buffalo, N. Y.

ST. LOUIS RAILWAY CLUB.—B. W. Fraenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 18, 1912, Louisville, Ky.

TRANSPORTATION CLUB OF BUFFALO.—M. Sells, Buffalo; first Saturday after first Wednesday.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.; August, 1912.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Wednesday in month except July and August, Chicago.

WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md.; annual, January 16-18, Chicago.

Traffic News.

Business men of Savannah have held a meeting and given formal assurance to the Atlantic & Pacific Transport Company of sympathy with the plan for making Savannah a port of call on the New York-Colon line of the company.

The new transatlantic line between Boston and Rotterdam in connection with the New York, New Haven & Hartford and Canadian Pacific systems, will begin service in about ten days with two large steamers owned by the Canadian Pacific. This line expects to secure some of the grain traffic.

Morgan's Louisiana & Texas Railroad & Steamship Company will begin to run freight trains over its new line from Lafayette, La., to Baton Rouge, on November 5. On this line, which is 57 miles long, there are 15 stations between the points mentioned, 10 of which have agents.

Western lines have declined the proposition of Canadian lines to make reduced round trips for the so-called visitors' excursions from western Canada to Central West points during December on the ground that the proposition is an immigration scheme to induce more Americans to move into western Canada.

The new through express route between the Pacific Coast and New York was inaugurated on October 20. The route is from Oakland, Cal., via the Western Pacific, to Salt Lake City, Utah; via the Denver & Rio Grande to Denver, Colo.; via the Chicago, Burlington & Quincy to Chicago, and via the Pennsylvania to New York.

Florida's law prohibiting the shipment of immature fruit will be carried to the United States Court on the ground that the law as applied to interstate shipments is in violation of the commerce clause of the United States Constitution. According to C. H. B. Floyd, of counsel for Fred Fee, of St. Lucie County, who is under indictment in Florida for the shipment of fruit alleged to be immature.

In an appeal to the Secretary of State, the express companies say that their Oklahoma assessments were raised 10,000 to 50,000 per cent. by the State Board of Equalization. The Pacific Express Company placed the amount of assessable property within the state at \$850, and the board raised the amount to \$182,380. The valuation of the Wells Fargo company was raised from \$27,260 to \$672,635, the United States from \$41,636 to \$1,421,365, and the American from \$7,100 to \$702,145.

The Duluth & Iron Range and the Duluth, Missabe & Northern, both subsidiaries of the United States Steel Corporation, are to reduce the rate on ore from 80 cents to 60 cents. This 80-cent rate covers all shipping points on the Duluth, Missabe & Northern, and all Missabe Range points on the Duluth & Iron Range. From Tower the rate is 90 cents to the docks at Two Harbors, and from Ely \$1. The new rate will be a flat one of 60 cents per gross ton from all points on the two railways.

The Southern Pacific has put into active service between New York and Galveston four additional ships which had been idle all summer, and is now at work getting three other ships ready for the heavy autumn trade. Officers of the company say freight business between here and the two southern ports is fully 100 per cent. better than only a few months ago. In addition to the enormous northward movement of cotton there are unusually heavy shipments of sugar for this early season.

Some forty business concerns of Portland, Ore., have joined in an appeal to the Interstate Commerce Commission asking that the advance in class rates from New York, Chicago, Pittsburgh and other eastern points to Portland, which are to become effective November 1, be suspended until these concerns can be heard in the premises. They claim the advances are unjust, unreasonable and discriminatory, and in some cases violate the fourth section of the Interstate Commerce act. A telegram formulating their petition was sent to the Interstate Commerce Commission on October 14.

The Flour City Steamship Line—the line established by the Minneapolis millers to secure rates to Buffalo lower than the railways and regular steamship lines would grant—proposes to try to get the Commerce Court to issue a mandamus to compel

the Lehigh Valley to receive and forward flour from Buffalo to New York at a rate as low as is secured by the regular steamer lines. Questions by Judge Knapp indicated that the court would refuse a permanent writ on the ground that the Flour City line should first go to the Interstate Commerce Commission for a determination of the facts. The Flour City line has filed a complaint with the commission against the eastern lines asking for the establishment of a through rate and joint rate from Minneapolis to New York, which is set for a hearing on Saturday, October 28.

The Wall Street Journal's Analysis of the Pacific Coast Rate Question.

When Wall Street read in its morning paper July 25 last that the Interstate Commerce Commission had ordered a wholesale reduction in inter-mountain commodity rates transcontinental stocks dropped. The average estimate of the aggregate annual loss to the roads was about \$12,000,000. That estimate now appears just \$12,000,000 too high.

The traffic director of one of the largest systems affected by the ruling now declares that the roads do not expect to lose a dollar under the inter-mountain decision.

In that decision the commission said the interior rates were too far above coast rates. One way of correction was to lower the interior rates. The other, and for the roads the saving way, was to raise the coast rates.

The transcontinental lines have notified the commission of an increase in all class rates to the Pacific coast from eastern territory, and have completed a new tariff advancing commodity rates to the coast an average of 20 per cent. The roads thus not only give notice that they are preparing not to suffer any loss under the inter-mountain decisions, but go so far as to set forth the reasons for their utter confidence that the advances will be granted. They say that in its decisions the commission left the roads, perhaps intentionally, a tremendous loophole through which to escape from reduction of revenues. It did so by not declaring the interior rates too high of themselves, but merely too high as compared with coast rates.

In condensed detail the situation is as follows: As to class or general group rates the commission, in its decision of June 6, 1910, fixed lower definite class rates to inter-mountain points as reasonable charges for the service given. The roads are now taking those rates to interior points, fixed by the commission as reasonable, and adding to them a reasonable charge for the additional haul to the coast. Two members of the commission have already expressed their approval of this move as carrying out the principle laid down by the commission itself. This means that unless the commission's inter-mountain decisions are thrown out by the Commerce Court, the roads are prepared to abandon the water competition basis of rate making. They will boost the rate to the coast irrespective of water rates, to bring it into adjustment with the rate to interior points. They will do so even though thereby considerable coast business is lost to water competition.

This loss in coast traffic will probably offset the roads' additional revenue from the higher coast rates. This still leaves the roads to stand the loss suffered through lowered rates to the interior. The significance of the advance in coast class rates, however, is that the roads are thereby withdrawing a violation of the long and short haul principle and justifying application of that principle to commodity or article rates to the coast. Had the commission fixed definite lower commodity rates to the interior there would be little or no point to increasing commodity rates to the coast, as the higher rates would merely mean loss of business to water competitors.

In the Utah cases the commission did fix specific commodity rates to Utah points at what it considered a reasonable level, and the roads, accepting these rates as reasonable, will simply add a reasonable additional charge for the plus haul to the Pacific. In the Nevada and other inter-mountain cases, however, the commission did not fix definite commodity rates. It ruled that the existing interior points commodity rates were wrong as compared with those to more distant points. It held that, from the Missouri river, commodity rates to interior points should not be higher than those through to the coast; from Chicago points, not more than 7 per cent. higher; from Buffalo-Pittsburgh points, not more than 15 per cent higher, and from New York and trunk

line territory, not more than 25 per cent. above the coast rates. This means that if the roads left the coast rate unchanged they must lower the interior rates, which averaged well above these percentages over coast rates. If the roads raised the coast rates, however, while the rates to the interior must still be readjusted, there would be no need of lowering the average rate. Therefore the roads are raising the coast rates.

The complaints which opened the inter-mountain cases were complaints of certain communities that other communities were being fatted at their expense, and certainly the main point in the decisions was adjustment among communities. If the commission refuses the proposed coast advances now it must be on the ground that the (commodity) rates to interior points are unreasonable in themselves; that therefore it will not permit advance of rates to the coast which would permit the roads to maintain the present rates to the interior. This would require a new move by the commission which it has shown no reason for undertaking.

That the commission did declare the interior rates unreasonable to Utah but not in the Nevada and other cases is fair evidence that they intended to leave the roads the above way out of their threatened loss in revenue; that is, that the main and important point they were making was that there must be a readjustment of relation between interior and coast rates. It would seem that the increase in coast rates will solve the problem and that

the adjustment will not after all be accomplished by any loss in revenue.

As the readjustment ordered was not to go into effect until October 15, in the Nevada cases and November 1 in the other cases, and the dates have been postponed pending a decision by the Commerce Court as to whether the inter-mountain decisions shall stand, the roads have suffered no loss as yet. If the court overrules the commission the roads will be where they were before the inter-mountain cases were decided, and if it sustains the commission the higher coast rates will be filed in time to obviate the necessity of reducing interior rates on the average, leaving the mere readjustment of zones, a clerical burden, but easier to bear than reduced earning power.—*Wall Street Journal*.

Car Surpluses and Shortages.

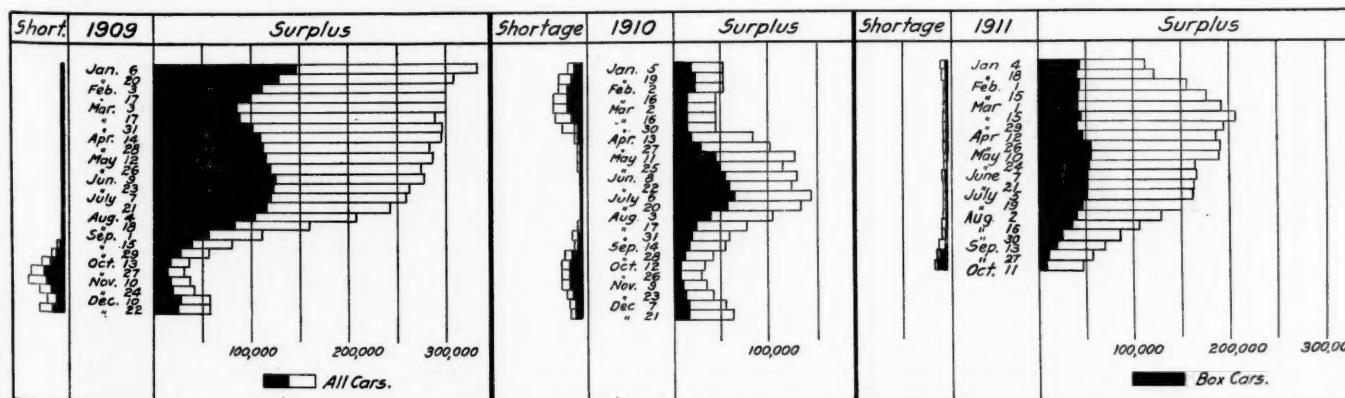
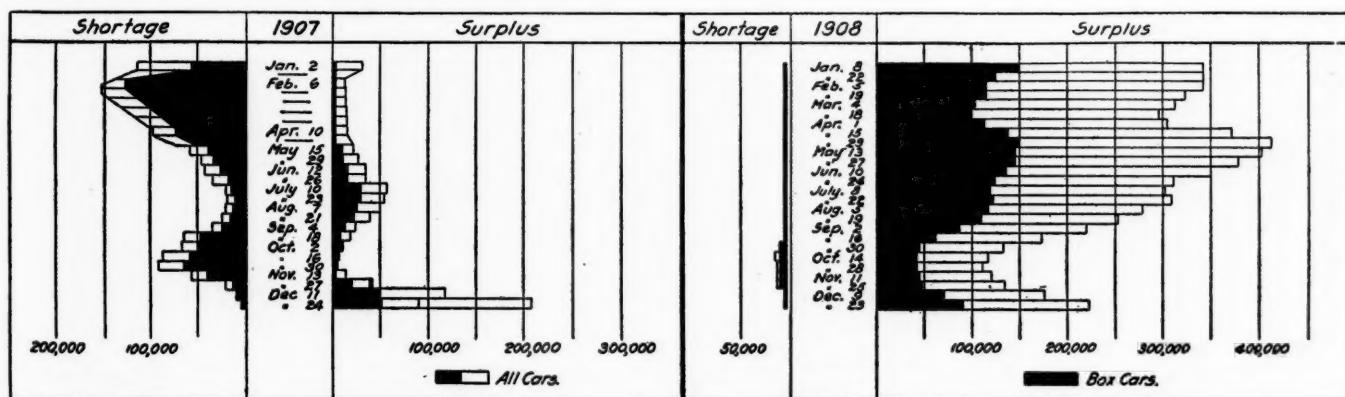
Arthur Hale, chairman of the committee on relations between railways of the American Railway Association in presenting statistical bulletin No. 105, giving a summary of car shortages and surpluses by groups from June 8, 1910, to October 11, 1911, says:

"The total car surplus reported for the period ending October 11, 1911, is 48,854 cars, and is the smallest surplus reported since November 23, 1910. During the two weeks ending with October 11, 1911, the total car surplus decreased 9,528 cars. Of this de-

CAR SURPLUSES AND SHORTAGES.

| Date. | No. of roads. | Surpluses | | | | | Shortages | | | | |
|---------------------------------|---------------|-----------|-------|---------------------|--------------|--------|-----------|-------|---------------------|--------------|--------|
| | | Box. | Flat. | gondola and hopper. | Other kinds. | Total. | Box. | Flat. | gondola and hopper. | Other kinds. | Total. |
| Group *1.—October 11, 1911..... | 7 | 181 | 463 | 243 | 217 | 1,104 | 807 | 160 | 350 | 0 | 1,317 |
| " 2.— " 11, 1911..... | 22 | 1,249 | 98 | 4,695 | 1,942 | 7,984 | 359 | 1 | 186 | 55 | 601 |
| " 3.— " 11, 1911..... | 25 | 1,485 | 246 | 5,728 | 1,633 | 9,092 | 616 | 54 | 225 | 52 | 947 |
| " 4.— " 11, 1911..... | 10 | 143 | 59 | 614 | 1,350 | 2,166 | 715 | 257 | 350 | 14 | 1,336 |
| " 5.— " 11, 1911..... | 17 | 130 | 25 | 725 | 1,141 | 2,021 | 460 | 170 | 50 | 0 | 680 |
| " 6.— " 11, 1911..... | 24 | 5,334 | 744 | 1,345 | 3,141 | 10,564 | 85 | 4 | 101 | 32 | 222 |
| " 7.— " 11, 1911..... | 3 | 19 | 0 | 45 | 223 | 287 | 200 | 61 | 0 | 0 | 261 |
| " 8.— " 11, 1911..... | 17 | 1,006 | 90 | 986 | 1,653 | 3,735 | 995 | 142 | 250 | 1 | 1,388 |
| " 9.— " 11, 1911..... | 11 | 603 | 355 | 330 | 631 | 1,919 | 50 | 0 | 0 | 0 | 50 |
| " 10.— " 11, 1911..... | 19 | 253 | 680 | 1,703 | 5,376 | 8,012 | 2,617 | 13 | 0 | 6 | 2,636 |
| " 11.— " 11, 1911..... | 5 | 84 | 901 | 82 | 903 | 1,970 | 3,186 | 221 | 0 | 112 | 3,519 |
| Total | 160 | 10,487 | 3,661 | 16,496 | 18,210 | 48,854 | 10,090 | 1,083 | 1,512 | 272 | 12,957 |

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin, Minnesota and the Dakotas lines; Group 7—Montana, Wyoming and Nebraska lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Oregon, Idaho, California and Arizona lines; Group 11—Canadian lines.



Car Surpluses and Shortages in 1907 to 1911.

crease 1,885 are box cars, 183 are flat cars, 3,047 are coal cars and 4,413 are miscellaneous cars. The decrease is chiefly in group 6, and there is a slight decrease in all other groups with the exception of group 4 (West Virginia, Virginia, North Carolina and South Carolina), which reports a very small increase.

"There is an increase of 4,613 cars reported in the total shortage. Box car shortage increased from 6,632 cars on September 27 to 10,090 on October 11, an increase of 3,458 cars or 52.14 per cent. Miscellaneous cars show a decrease of 118 cars, while flat and coal cars increased 716 cars, and 567 cars respectively."

The accompanying table gives the figures by groups for the last period covered by the report and the charts show total bi-weekly surpluses and shortages from 1907 to 1911.

Traffic Club of New York.

At the meeting of the Traffic Club of New York, to be held October 31, Edwin J. Clapp, of New York University, will make an address on German waterways.

INTERSTATE COMMERCE COMMISSION.

A hearing will begin at Des Moines, Iowa, on October 28, on complaints that have been filed with the Interstate Commerce Commission at different times on a variety of freight rates and adjustments of rates which are alleged to discriminate against Des Moines. Certain class and commodity rates between points in Iowa and points in adjacent states will also be investigated, and it is intended to continue the hearing until all the Iowa cases are heard.

In its investigation of express rates, the commission has issued an order to express companies to furnish the commission by December 1 with a great mass of details of the company's operations. These details include the names of officers and stockholders; amount of issues of securities; copies of contracts with railways; number of packages, newspapers and magazines handled; changes in express rates during the last 20 years; considerations, if any, paid to railway officers to induce the execution of contracts, and total amount paid to railways for the year ended June 30, 1911.

Complaint Dismissed.

American Manufacturing Co. v. Louisville & Nashville et al. Opinion by the commission:

Pieces of iron may be manufactured into various articles without remelting should not be classed as scrap iron under the definition contained in the southern classification, which provides that scrap-iron rates will apply only on scraps and pieces of iron and steel which have value for remelting purposes only. (21 I. C. C., 483.)

Minimum Weight Ruling.

C. W. Hull Company v. Missouri Pacific Railway Co. et al. Opinion by the commission:

Tariff rule providing minimum weight of 50,000 lbs. on brick subject to rule "Except when marked capacity of car is less, in which event the marked capacity of the car will govern" was construed by carrier to vary the minimum only when carrier was unable to furnish cars of the prescribed capacity. The rule so construed was unfair and should have provided that when shipper ordered car of certain capacity and the carrier for its own convenience, furnished a car of greater capacity than that ordered, the capacity of the car ordered should be applied subject to actual weight if in excess. (21 I. C. C., 486.)

Complaints to the Commission and Suspensions of Tariffs.

The commission has suspended until March 14 the proposed advances in the rates on cattle and calves over the Chicago, Rock Island & Pacific and its connections. The rates were to have taken effect November 15.

The commission has further suspended the new regulations that were proposed for pre-cooling and pre-icing fruit handled by the Southern Pacific and the San Pedro, Los Angeles & Salt Lake.

The commission has suspended the proposed advances in rates on bran, barley and wheat on the Atchison, Topeka & Santa Fe

lines which were to have become effective on November 1.

The United States Navy Department has complained to the Interstate Commerce Commission that the roads participating in a shipment of launches from Portsmouth, N. H., to Norfolk, made an overcharge of \$35.21, due to having furnished cars with a minimum carload rating of 20,000 lbs. when the Navy Department asked for cars with a 16,200-lb. minimum.

STATE COMMISSIONS.

The Indiana Commission has appointed James Donahue, of Indianapolis, locomotive boiler inspector; salary, \$2,000 a year.

The Railroad Commission of Louisiana is to hold a hearing on October 25 on the question of abolishing all concentration charges on cotton seed at cotton seed mill points.

The New York State Public Service Commission, First district, has adopted an order that after June 1, 1912, all surface street cars in New York City must have power brakes and geared hand-brakes.

The Railroad Commission of Louisiana has ordered the American Express Company and certain other express companies to put sufficient men on their delivery wagons to unload such shipments as are too heavy or bulky to be handled by one man.

Prof. Garrett Droppers, professor of political economy at Williams College, who has been appointed a member of the Massachusetts State Railway Commission, was born in Milwaukee, April 12, 1860, and graduated from Harvard in 1887. He pursued special studies in economics, finance and political science. In 1888-89 he studied at the University of Berlin. From 1889 to 1898 he was professor of political economy and finance at Tokio University, Japan, and then for nine years was president of the University of South Dakota. In 1907-8 he lectured on political economy at Chicago University. He translated Schopenhauer's essays. He has contributed many articles on economic and political topics to learned societies' publications.

The Public Utilities Commission of New Jersey has ordered the New York & Long Branch, after November 1 to stop passenger trains at Asbury Park on Sundays. For many years the trains of this road have run through Ocean Grove and Asbury Park on Sundays without stopping. This is in pursuance of an agreement made with the Ocean Grove Camp Meeting Association. Asbury Park is outside the Ocean Grove reservation, but the Camp Meeting Association has, until now, succeeded in regulating this matter of train stops both on its own grounds and in Asbury Park. The commission seems to have held, in substance, that the contract of the railways with the Camp Meeting Association was contrary to public policy.

COURT NEWS.

The Supreme Court has set the hearing in the government's appeal in the Union Pacific-Southern Pacific merger suit for January 8.

The Commerce Court is now hearing the argument on a petition to set aside the orders of the Interstate Commerce Commission in Pacific Coast cases of the Atchison, Topeka & Santa Fe and the Union Pacific.

At Cincinnati, October 16, the Louisville & Nashville was fined \$200 in the United States District Court on the charge of transporting two cars of scabby sheep from Southern Kentucky without properly branding the cars.

Judge Thurman in the circuit court at Nevada, Mo., on October 16, held as legal the law recently passed by the general assembly of Missouri requiring employers, including railways, to pay their employees at least twice a month. The case which was tried to test the constitutionality of the law will be appealed.

The Commerce Court has issued a temporary injunction suspending the order of the Interstate Commerce Commission in the case known as the Nashville grain rebilling case, in which the Interstate Commerce Commission had ordered the discontinuance of an allowance for rebilling or reshipping grain, hay, etc., at Nashville while refusing the same privilege at Atlanta and other Georgia points.

COMPARATIVE SUMMARY OF MONTHLY REPORTS OF REVENUES AND EXPENSES OF STEAM ROADS IN THE UNITED STATES.

RAIL OPERATIONS.

| Mileage Operated at End of Month. | Freight Revenue, (Account 1.) | Passenger Revenue, (Account 2.) | Other Transportation Revenue. (Accounts 3 to 11) (Accounts 12 to 21) | Nontrans- portation Revenue. | Total Operating Revenues. | Maintenance of Way | Maintenance of Equipment. | Traffic Expenses. | Transportation Expenses. |
|--|-------------------------------------|---------------------------------------|---|------------------------------------|---------------------------------|-----------------------|------------------------------|----------------------|-----------------------------|
| YEAR ENDING JUNE 30, 1911. | | | | | | | | | |
| JULY | \$1910 | \$149,982,344 | \$62,254,710.26 | \$2,195,367.44 | \$330,963,554.91 | \$34,371,454.29 | \$5,138,038.44 | \$77,924,459.33 | |
| YEAR ENDING JUNE 30, 1910. | | | | | | | | | |
| July | \$1909 | \$142,073,172.49 | \$68,231,231.35 | 1,921,159.01 | \$217,803,454.31 | 31,556,367.12 | 4,600,853.30 | \$67,087,014.37 | |
| August | \$1910 | \$159,944 | 16,578,782,434 | 66,308,262.44 | 2,339,706.43 | 254,005,972.42 | 5,243,895.56 | 80,814,438.14 | |
| September | \$1909 | 16,225,726.49 | 63,571,865.51 | 15,471,187.48 | 2,445,799.57 | 256,647,702.17 | 32,652,732.95 | 69,597,611.52 | |
| October | \$1910 | 17,623,871.28 | 17,633,253.93 | 16,926,189.44 | 2,186,495.37 | 2,450,650.50 | 5,115,231.17 | 5,115,231.17 | |
| November | \$1909 | 18,102,922.25 | 17,611,874.27 | 15,641,454.11 | 2,550,538.27 | 26,346,605.06 | 34,386,902.21 | 72,939,656.64 | |
| December | \$1910 | 18,655,219.29 | 18,655,219.29 | 18,655,219.29 | 2,372,374.25 | 24,500,821,546.10 | 33,943,166.94 | 4,969,653.34 | |
| JANUARY | \$1909 | 18,723,454 | 18,655,219.29 | 18,655,219.29 | 2,331,650.29 | 24,500,821,546.10 | 33,943,166.94 | 4,969,653.34 | |
| FEBRUARY | \$1910 | 18,723,454 | 18,655,219.29 | 18,655,219.29 | 2,331,650.29 | 24,500,821,546.10 | 33,943,166.94 | 4,969,653.34 | |
| MARCH | \$1910 | 18,723,454 | 18,655,219.29 | 18,655,219.29 | 2,331,650.29 | 24,500,821,546.10 | 33,943,166.94 | 4,969,653.34 | |
| APRIL | \$1911 | 18,723,454 | 18,655,219.29 | 18,655,219.29 | 2,331,650.29 | 24,500,821,546.10 | 33,943,166.94 | 4,969,653.34 | |
| MAY | \$1911 | 18,723,454 | 18,655,219.29 | 18,655,219.29 | 2,331,650.29 | 24,500,821,546.10 | 33,943,166.94 | 4,969,653.34 | |
| JUNE | \$1911 | 18,723,454 | 18,655,219.29 | 18,655,219.29 | 2,331,650.29 | 24,500,821,546.10 | 33,943,166.94 | 4,969,653.34 | |
| Total for Year Ending June 30, 1911. | | | | | | | | | |
| Total for Year Ending June 30, 1910. | | | | | | | | | |
| Increase 1911 Over 1910. | | | | | | | | | |
| Decrease 1911 Under 1910. | | | | | | | | | |
| Average per Mile of Line, 1911. | | | | | | | | | |
| Average per Mile of Line, 1910. | | | | | | | | | |
| Total for Year Ending June 30, 1911. | \$1,924,067,757.30 | \$66,684,392.90 | \$201,523,429.97 | \$28,300,071.12 | \$2,810,735,182.29 | \$368,512,482.08 | \$430,663,514.55 | \$996,677,415.87 | |
| Total for Year Ending June 30, 1910. | \$1,929,873,354.50 | \$629,503,471.78 | \$192,641,975.72 | \$26,790,465.96 | \$2,788,809,258.86 | \$372,098,382.35 | \$416,166,103.54 | \$56,061,266.60 | \$928,226,170.33 |
| Increase 1911 Over 1910. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Decrease 1911 Under 1910. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Average per Mile of Line, 1911. | 24,156.929 | 7,964.87 | 2,719.07 | 834.23 | 117.15 | 11,635.32 | 1,525.49 | 245.10 | 4,125.84 |
| Average per Mile of Line, 1910. | 23,791,745 | 8,111.52 | 2,645.89 | 809.70 | 112.61 | 11,679.72 | 1,563.97 | 235.63 | 3,901.67 |

RAIL OPERATIONS.

| General Expenses, | Total Operating Expenses. | Net Operating Revenue (or Deficit). | Total Operating Expenses. |
|--------------------------------------|---------------------------------|--|---------------------------------|--|---------------------------------|--|---------------------------------|--|---------------------------------|
| JULY | \$1910 | \$157,458,228.55 | \$73,157,547.36 | \$5,589,964.86 | \$5,189,923.21 | \$320,041.65 | \$73,477,589.01 | \$8,730,819.67 | \$64,746,769.34 |
| August | \$1909 | 16,743,305.66 | 87,643,305.66 | 2,239,529.59 | 495,722.66 | 7,839,609.63 | 7,839,609.63 | 7,839,609.63 | 7,839,609.63 |
| September | \$1909 | 16,549,023.97 | 14,577,952.38 | 5,922,250.46 | 5,480,573.36 | 511,677.10 | 90,028,750.66 | 8,856,009.14 | 64,356,432.96 |
| OCTOBER | \$1910 | 16,506,375.56 | 16,506,375.56 | 5,731,145.38 | 5,345,688.76 | 90,998,282.95 | 4,671,580.46 | 79,440,803.06 | 64,356,432.96 |
| NOVEMBER | \$1910 | 16,509,347.50 | 16,509,347.50 | 2,076,581.22 | 3,418,765.26 | 35,915,452.69 | 4,858,886.64 | 79,514,478.51 | 64,356,432.96 |
| DECEMBER | \$1910 | 16,506,156.56 | 16,506,156.56 | 3,828,893.06 | 3,439,874.53 | 36,036,147.60 | 3,565,721.98 | 78,990,488.18 | 64,356,432.96 |
| JANUARY | \$1911 | 16,506,156.56 | 16,506,156.56 | 5,157,005.56 | 5,157,005.56 | 16,607,460.00 | 3,160,702.29 | 78,990,488.18 | 64,356,432.96 |
| FEBRUARY | \$1911 | 16,506,156.56 | 16,506,156.56 | 2,380,893.06 | 2,380,893.06 | 16,607,460.00 | 3,160,702.29 | 78,990,488.18 | 64,356,432.96 |
| MARCH | \$1911 | 16,506,156.56 | 16,506,156.56 | 2,380,893.06 | 2,380,893.06 | 16,607,460.00 | 3,160,702.29 | 78,990,488.18 | 64,356,432.96 |
| APRIL | \$1911 | 16,506,156.56 | 16,506,156.56 | 2,380,893.06 | 2,380,893.06 | 16,607,460.00 | 3,160,702.29 | 78,990,488.18 | 64,356,432.96 |
| MAY | \$1911 | 16,506,156.56 | 16,506,156.56 | 2,380,893.06 | 2,380,893.06 | 16,607,460.00 | 3,160,702.29 | 78,990,488.18 | 64,356,432.96 |
| JUNE | \$1911 | 16,506,156.56 | 16,506,156.56 | 2,380,893.06 | 2,380,893.06 | 16,607,460.00 | 3,160,702.29 | 78,990,488.18 | 64,356,432.96 |
| Total for Year Ending June 30, 1911. | | | | | | | | | |
| Total for Year Ending June 30, 1910. | | | | | | | | | |
| Increase 1911 Over 1910. | | | | | | | | | |
| Decrease 1911 Under 1910. | | | | | | | | | |
| Average per Mile of Line, 1911. | | | | | | | | | |
| Average per Mile of Line, 1910. | | | | | | | | | |
| Total for Year Ending June 30, 1911. | \$1,928,742,214.76 | \$63,063,454.87 | \$63,063,454.87 | \$61,336,067.91 | \$1,911,073.01 | \$10,750,080.08 | \$175,153,960.46 | | |
| Total for Year Ending June 30, 1910. | \$1,928,652,66 | \$63,063,454.87 | \$63,063,454.87 | \$61,336,067.91 | \$1,911,073.01 | \$10,450,610.54 | \$175,153,960.46 | | |
| Increase 1911 Over 1910. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Decrease 1911 Under 1910. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Average per Mile of Line, 1911. | 207,442 | 7,944.22 | 3,048.84 | 287.24 | 1,262.23 | 2,608.86 | 607,892.42 | 40.18 | 60,658,077.08 |
| Average per Mile of Line, 1910. | 207,442 | 7,944.22 | 3,048.84 | 287.24 | 1,262.23 | 2,608.86 | 7,910.59 | 10.59 | 3,208.83 |
| Total for Year Ending June 30, 1911. | | | | | | | | | |
| Total for Year Ending June 30, 1910. | | | | | | | | | |
| Increase 1911 Over 1910. | | | | | | | | | |
| Decrease 1911 Under 1910. | | | | | | | | | |
| Average per Mile of Line, 1911. | | | | | | | | | |
| Average per Mile of Line, 1910. | | | | | | | | | |
| Total for Year Ending June 30, 1911. | \$1,928,742,214.76 | \$63,063,454.87 | \$63,063,454.87 | \$61,336,067.91 | \$1,911,073.01 | \$10,750,080.08 | \$175,153,960.46 | | |
| Total for Year Ending June 30, 1910. | \$1,928,652,66 | \$63,063,454.87 | \$63,063,454.87 | \$61,336,067.91 | \$1,911,073.01 | \$10,450,610.54 | \$175,153,960.46 | | |
| Increase 1911 Over 1910. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Decrease 1911 Under 1910. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Average per Mile of Line, 1911. | 207,442 | 7,944.22 | 3,048.84 | 287.24 | 1,262.23 | 2,608.86 | 607,892.42 | 40.18 | 3,208.83 |
| Average per Mile of Line, 1910. | 207,442 | 7,944.22 | 3,048.84 | 287.24 | 1,262.23 | 2,608.86 | 7,910.59 | 10.59 | 3,513.03 |

¹ Includes unclassified, \$7,065.83; ² \$6,731.50; ³ \$6,497.12; ⁴ \$7,905.83; ⁵ \$2,707.83; ⁶ \$1,029.39; ⁷ \$1,874.27; ⁸ \$1,547.61; ⁹ \$2,006.38; ¹⁰ \$1,873.02; ¹¹ \$1,492.21; ¹² \$1,555.07; ¹³ \$2,398.17; ¹⁴ average.^a Includes unclassified, \$2,964.32; ^b \$3,373.75; ^c \$4,995.55; ^d \$6,381.41; ^e \$6,434.03; ^f \$8,562.69; ^g \$5,995.88; ^h \$6,209.34; ⁱ \$7,915.10; ^j \$6,431.05; ^k \$6,431.05; ^l \$7,915.10; ^m \$71,473.18; ⁿ \$30 average.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF JULY, 1911. (SEE ALSO ISSUE SEPTEMBER 15.)*

| Name of road. | Operating revenues— | | Maintenance— | | Total, inc. misc. | Way and structure equipment. | Traffic. | Transportation. | General. | Total. | Net operating revenue (or deficit). | Outside operations, net. | Taxes. | Operating income (or loss), comp. with last year. | | |
|---|------------------------------------|--------------------|--------------------|--------------------|--------------------|------------------------------|--------------------|--------------------|--------------------|--------------------|-------------------------------------|--------------------------|--------------------|---|--------------------|--------|
| | Mileage operated at end of period. | Freight. | Pasenger. | Total, inc. misc. | \$23,334 | \$19,071 | 2,631 | 58,494 | 5,720 | \$112,880 | \$1,492 | 1,85 | \$13,985 | \$43,103 | | |
| Ann Arbor | 291 | \$8,706 | \$58,109 | \$168,323 | 18,522 | 10,455 | 2,631 | 44,296 | 9,122 | 85,026 | 82,297 | 1,85 | 4,700 | 78,782 | | |
| Arizona Eastern | 354 | 126,420 | 32,583 | 97,909 | 12,396 | 18,474 | 4,725 | 29,267 | 4,789 | 69,651 | 28,58 | 221 | 5,189 | 20,337 | | |
| Arizona & West Point | 92 | 44,785 | 43,935 | 23,312 | 35,544 | 16,450 | 9,138 | 8,640 | 17,931 | 53,395 | 2,874 | 4,359 | 4,110 | 4,087 | | |
| Atlanta & Birmingham & Atlantic | 661 | 66,764 | 59,754 | 32,738 | 10,381 | 21,997 | 4,456 | 45,227 | 2,874 | 107,523 | 16,421 | 3,711 | 6,659 | 10,370 | | |
| Atlanta & St. Lawrence | 166 | 72,623 | 245,204 | 329,351 | 11,132 | 11,140 | 2,170 | 127,218 | 2,270 | 159,930 | 169,421 | 4,071 | 7,000 | 158,350 | | |
| Atlantic City | 166 | 166 | 166 | 166 | 166 | 166 | 166 | 166 | 166 | 166 | 166 | 166 | 166 | 166 | 166 | |
| Belt Ry. Co. of Chicago | 21 | 67,723 | 117,888 | 82,232 | 13,282 | 127,973 | 7,13 | 71,427 | 5,823 | 120,898 | 88,897 | 3,99 | 5,500 | 83,397 | 5,023 | |
| Buffalo, Rochester & Pittsburgh | 572 | 572 | 50,069 | 16,465 | 55,447 | 30,295 | 10,497 | 247,120 | 16,815 | 537,687 | 284,545 | 399 | 17,000 | 267,944 | 9,597 | |
| Canadian Pacific Lines in Maine | 233 | 535,713 | 364,908 | 97,842 | 13,892 | 20,361 | 5,384 | 26,589 | 17,948 | 76,914 | 23,313 | 8,212 | 4,700 | 74,456 | 30,467 | |
| Central of Georgia | 1,915 | 352,503 | 142,602 | 43,908 | 7,522 | 7,522 | 34,446 | 36,937 | 36,478 | 74,814 | 18,212 | 4,700 | 47,400 | 194,126 | 70,954 | |
| Cincinnati, Indianapolis & Louisville | 616 | 608,216 | 876,363 | 90,993 | 136,201 | 17,069 | 365,381 | 18,185 | 18,212 | 13,552 | 361,297 | 22,500 | 8,137 | 160,379 | 8,137 | |
| Detroit, Grand Haven & Milwaukee | 190 | 63,391 | 22,365 | 97,456 | 117,261 | 26,671 | 7,163 | 26,671 | 7,163 | 10,510 | 322,042 | 585,414 | 6,361 | 36,706 | 555,855 | 34,525 |
| Duluth & Iron Range | 190 ³ | 82,939 | 1,036,292 | 43,747 | 107,471 | 73,528 | 25,03 | 143,879 | 12,596 | 339,972 | 696,315 | 8,394 | 45,295 | 659,414 | 245,190 | |
| Duluth, Missabe & Northern | 328 ⁴ | 981,400 | 422,492 | 66,293 | 83,141 | 20,370 | 215,087 | 12,322 | 12,322 | 397,213 | 163,041 | 2,277 | 31,635 | 131,129 | 56,811 | |
| Evansville & Terre Haute | 347 ⁵ | 299,512 | 122,492 | 561,254 | 66,293 | 83,141 | 20,370 | 215,087 | 12,322 | 397,213 | 163,041 | 2,277 | 31,635 | 131,129 | 56,811 | |
| Grand Trunk Western | 307 | 106,924 | 39,224 | 166,501 | 23,446 | 33,151 | 1,570 | 44,585 | 7,376 | 110,128 | 46,373 | 5,037 | 5,037 | 41,336 | 2,329 | |
| Great & Ship Island | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | |
| Indianapolis, Southern, Mexico & Orient | 764 ⁶ | 89,518 | 118,503 | 1,04,029 | 34,331 | 34,331 | 8,471 | 64,675 | 6,675 | 149,272 | 149,272 | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | |
| Kansas City | 1,439 | 2,422,447 | 512,862 | 3,091,156 | 356,335 | 49,463 | 83,231 | 98,494 | 67,530 | 1,984,053 | 1,107,603 | 1,107,603 | 1,107,603 | 1,107,603 | 1,107,603 | |
| Leland Valley | 3,916 | 1,549,208 | 439,221 | 2,117,192 | 45,352 | 49,109 | 60,541 | 94,294 | 71,864 | 2,020,160 | 1,51,76 | 2,733 | 84,902 | 94,255 | 133,760 | |
| Missouri Pacific | 165 | 110,872 | 110,061 | 124,992 | 14,630 | 14,630 | 3,333 | 23,380 | 23,380 | 66,723 | 182,506 | 182,506 | 4,500 | 62,223 | 64,134 | |
| Northwestern Pacific | 403 ⁷ | 121,308 | 254,737 | 337,899 | 48,591 | 38,974 | 9,351 | 114,828 | 9,049 | 215,393 | 182,506 | 182,506 | 12,714 | 169,792 | 5,650 | |
| Philadelphia & Reading | 1,014 | 2,552,844 | 663,362 | 3,397,724 | 362,089 | 668,195 | 44,136 | 1,105,273 | 74,521 | 2,254,214 | 1,143,510 | 18,998 | 90,701 | 1,071,807 | 4,125 | |
| Pittsburgh, Shawmut & Northern | 240 | 86,146 | 9,209 | 97,144 | 14,725 | 22,261 | 1,109 | 29,555 | 7,376 | 71,475 | 25,669 | 1,014 ² | 1,014 ² | 1,014 ² | 1,014 ² | |
| Port Reading | 241 | 66,711 | 3,091,029 | 3,088,442 | 445,187 | 10,638 | 19,864 | 10,638 | 10,638 | 10,638 | 30,998 | 38,067 | 1,678 | 3,800 | 22,589 | 2,275 |
| St. Louis & San Francisco | 473 | 1,840,70 | 1,24,080 | 52,909 | 44,176 | 40,866 | 51,561 | 761,827 | 65,727 | 1,18,213 | 2,11,213 | 1,18,213 | 1,18,213 | 154,715 | 828,499 | 12,061 |
| St. Louis, Iron Mountain & Southern | 3,313 | 1,588,829 | 2,264,619 | 92,091 | 92,091 | 92,091 | 2,091 | 2,091 | 2,091 | 53,600 | 1,727,717 | 53,600 | 53,600 | 451,241 | 62,300 | 62,300 |
| Spokane & Inland Empire | 177 | 19,967 | 66,402 | 180,888 | 42,233 | 41,976 | 39,504 | 6,479 | 10,079 | 10,962 | 19,991 | 32,042 | 14,903 | 4,000 | 42,945 | 22,368 |
| Spokane, Portland & Seattle | 550 ⁸ | 218,852 | 180,888 | 145,116 | 145,116 | 145,116 | 11,532 | 1,15,779 | 2,240 | 44,660 | 2,364 | 76,575 | 3,737 | 42,945 | 46,679 | |
| Ulster & Delaware | 128 | 59,916 | 79,815 | 86,319 | 66,319 | 66,319 | 11,909 | 19,320 | 12,511 | 24,311 | 68,541 | 180 | 180 | 3,300 | 65,061 | |
| Western Maryland | 545 | 456,351 | 105,756 | 88,714 | 88,714 | 88,714 | 19,974 | 29,185 | 4,891 | 31,311 | 125,166 | 771 | 21,000 | 1,957 | 54,421 | |
| Western Ky. of Alabama | 133 | 50,395 | 39,14 | 50,395 | 39,14 | 39,14 | 19,974 | 29,185 | 4,891 | 31,311 | 125,166 | 771 | 21,000 | 1,957 | 54,421 | |

*These reports were filed too late for publication in our issue of September 15.

†Road heretofore reported regularly, consolidated in Illinois Central for both years since July 1, 1911.

Mileage operated on July 31, 1910—1,315 miles; 2,1036 miles; 4,167 miles; 5,335 miles; 6,293 miles; 7,376 miles; 8,429 miles; 9,740 miles; 10,927 miles; 11,157 miles.

‡Road heretofore reported regularly, consolidated in Illinois Central for both years since July 1, 1911.

Mileage operated on July 31, 1910—1,315 miles; 2,1036 miles; 4,167 miles; 5,335 miles; 6,293 miles; 7,376 miles; 8,429 miles; 9,740 miles; 10,927 miles; 11,157 miles.

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Mileage operated on July 31, 1910—1,315 miles; 2,1036 miles; 4,167 miles; 5,335 miles; 6,293 miles; 7,376 miles; 8,429

formerly second trick despatcher, has been appointed chief train despatcher.

The following officers of the Gulf, Colorado & Santa Fe, with headquarters at Galveston, Tex., have had their jurisdiction extended over the Santa Fe Dock & Channel Company: J. H. Keefe, assistant general manager; W. E. Maxson, general superintendent; J. Matthews, telegraph manager, and W. L. Sheldon, car accountant.

Traffic Officers.

A. J. Orth has been appointed contracting freight agent of the Erie, with office at Cincinnati, Ohio.

Joseph Folkman has been appointed a traveling passenger agent of the New York, Chicago & St. Louis, with office at Cleveland, Ohio.

Walter Shipley, commercial agent of the Southern Railway at Dallas, Tex., has been appointed district freight agent, with office at New Orleans, La.

F. M. Miller, soliciting agent of the Kanawha Despatch at Salt Lake City, Utah, has been transferred to Los Angeles, Cal. E. C. Doolittle succeeds Mr. Miller.

J. L. Sullivan, assistant general freight agent of the Fort Dodge, Des Moines & Southern at Chicago, has been appointed general freight and passenger agent.

E. F. Flinn, commercial agent of the Grand Trunk at Pittsburgh, Pa., has been appointed division freight agent, with office at Chicago. S. E. Dewey, traveling freight agent at New York, succeeds Mr. Flinn.

The duties of the passenger traffic manager of the Chesapeake & Ohio will be assumed hereafter by J. D. Potts, general passenger agent at Richmond, Va., H. W. Fuller, passenger traffic manager, having died on October 12, as has already been announced in these columns.

G. S. Burnam, general agent of the Louisville & Nashville at St. Louis, Mo., has been appointed general agent, with office at New Orleans, La., succeeding O. P. Bartlett, resigned to accept service with another company. A. E. Mann, commercial agent at Cleveland, Ohio, succeeds Mr. Burnam.

The following officers of the Gulf, Colorado & Santa Fe, with headquarters at Galveston, Tex., have had their jurisdiction extended over the Santa Fe Dock & Channel Company: J. S. Hershey, general freight agent; W. S. Keenan, general passenger agent, and J. B. Moore, general baggage agent.

P. C. Stohr, assistant director of traffic of the Southern Pacific company, the Union Pacific, the Oregon Short Line and the Oregon-Washington Railroad & Navigation Company, will continue to have his office at Chicago, while the director of traffic has had his office moved to New York City, as has been announced in these columns.

H. Berterman, general agent in the passenger department of the Cleveland, Cincinnati, Chicago & St. Louis & Peoria, Ill., has been appointed general agent in the passenger department with office at Louisville, Ky., succeeding R. C. Kennedy, promoted. M. L. Griffin, traveling passenger agent at Huntington, W. Va., succeeds Mr. Berterman.

W. O. Warthen, district passenger agent of the Chesapeake & Ohio at Richmond, Va., has been appointed assistant general passenger agent, with office at Richmond, succeeding William S. Bronson, who has been transferred to the legal department, and R. R. Bilter, commercial agent at Kansas City, has been transferred to Chicago; effective November 1.

N. C. Barnett, traveling freight agent of the St. Louis & San Francisco at New Orleans, La., has been appointed commercial agent, with office at New Orleans, succeeding S. B. Franklin, resigned to go with another company. G. N. Donaldson, soliciting freight agent at New Orleans, succeeds Mr. Barnett as traveling freight agent, and E. B. Wood, traveling freight agent of the Pere Marquette at St. Louis, Mo., succeeds Mr. Donaldson, with office at New Orleans, La.

A. B. Scott, agent of the Anchor Line of the Pennsylvania Railroad at New York City, has been appointed district freight solicitor of the Pennsylvania Railroad, with office at

Philadelphia, Pa. Joseph Weed, freight solicitor at Philadelphia, succeeds Mr. Scott; J. Harry Cross, freight solicitor at Newark, N. J., succeeds Mr. Weed; R. Alan Turner, freight solicitor at Philadelphia, succeeds Mr. Cross; H. P. Dunbar, Jr., freight solicitor at Buffalo, N. Y., succeeds Mr. Turner, and W. McL. Pomeroy, freight rate clerk at Philadelphia, succeeds Mr. Dunbar.

Engineering and Rolling Stock Officers.

F. C. Pickard, master mechanic of the Cincinnati, Hamilton & Dayton, has been appointed master mechanic of the Pere Marquette, with office at Saginaw, Mich.

F. Merritt, chief engineer of the Gulf, Colorado & Santa Fe, with office at Galveston, Tex., has had his jurisdiction extended over the Santa Fe Dock & Channel Company.

John Burns has been appointed master mechanic, Eastern division, of the Canadian Pacific, with office at Montreal, Que., succeeding J. B. Elliott, retired under the pension rules of the company.

James W. Gibbs, whose appointment as master mechanic of the Virginia & Southwestern, with office at Bristol, Va.-Tenn., has been announced in these columns, was born in Rutherfordton

county, N. C., on August 31, 1873, and began railway work on May 12, 1902, as a machinist on the Southern Railway at Spencer. Previous to this he had been in the service of the Mecklenburg Iron Works at Charlotte, as a machinist apprentice. In July, 1902, he was appointed roundhouse foreman of the Southern Railway, remaining in that position until July, 1906, when he became fireman on the Asheville division, and was promoted to engineman the following August. In March, 1908, he entered the mechanical department of the same road as assistant roundhouse

foreman at Atlanta, Ga., and the following October was promoted to general foreman of the Southern Railway shops at Asheville, N. C., which position he held at the time of his recent appointment as master mechanic of the Virginia & Southwestern.

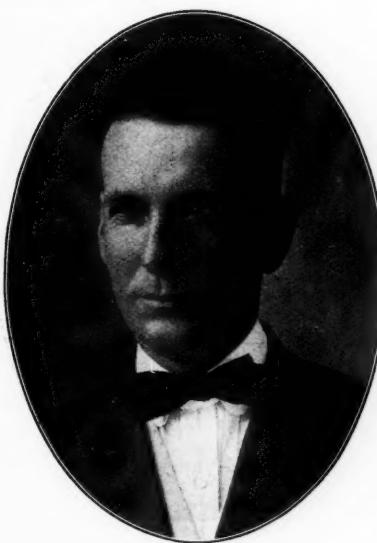
OBITUARY.

T. J. Conners, superintendent of the Cincinnati division of the Chesapeake & Ohio, at Covington, Ky., died in that city on October 21.

F. C. Falvey, traveling agent of the Minneapolis, St. Paul & Sault Ste. Marie, with office at Minot, N. D., died at his home in that city on October 23.

John Nelson Purviance, chief clerk to W. A. Patton, assistant to the president of the Pennsylvania Railroad, died on October 23, at Philadelphia, Pa. Mr. Purviance was born at Pittsburgh, Pa., in July, 1873, and entered the service of the Pennsylvania Railroad in the accounting department at Philadelphia in January, 1890.

Henry Strong, president of the Atchison, Topeka & Santa Fe from May, 1873, to May, 1874, died in Denver, Colo., on October 21, at the age of 82 years. Mr. Strong was born in Glasgow, Scotland, and, except for the time he spent at his summer homes at Lake Geneva, Wis., and Santa Barbara, Cal., he has been a resident of Chicago since 1874. He began the practice of law at Keokuk, Iowa, and previous to his election as president of the Santa Fe, was counsel of the Chicago, Burlington & Quincy. He had large real estate holdings in Chicago.



J. W. Gibbs.

John R. Walsh, formerly president of the Southern Indiana and the Chicago Southern, died at Chicago on October 23. Mr. Walsh was born in Ireland in 1837, and came to Chicago in 1847. He founded the Chicago National Bank in 1882, of which he was president until it was placed in liquidation in December, 1905. From 1897 to 1910 he was president of the railways mentioned above, which have since been reorganized as the Chicago, Terre Haute & Southeastern. Mr. Walsh was a man of great energy and ambition. His schemes for railways and other enterprises got the better of him. As bank president he lent the depositors' money to himself as railway president. In his eagerness he neglected to keep within the law, and was indicted on many counts and tried. In 1908 he was found guilty and sentenced to five years and sent to prison. He was pardoned only nine days before his death. He attempted to build a road from Terre Haute, Ind., to Chicago in competition with the Pennsylvania and the Chicago & Eastern Illinois. Into this and the Southern Indiana, a coal road, operating 225 miles of track between Westport and Terre Haute, he sunk his private fortune and the assets of his bank.

Robert Mather, general counsel of the Chicago & Alton, and chairman of the board of directors of the Westinghouse Electric & Manufacturing Company, also a director of many banks and railways, and for many years prominent as counsel for large corporations and an expert on railway affairs, died of peritonitis at his home, in New York City, on October 24. Mr. Mather was born at Salt Lake City, Utah, in 1859, and was educated in the public schools and at Knox College, Galesburg, Ill., graduating with the degree of A. B. in 1882, and later receiving degree of A. M. He began railway work in 1882, and previous to 1885 he was in the treasurer's office of the Chicago, Burlington & Quincy, and in 1886 he was admitted to the Illinois bar. In 1889 he became local attorney at Chicago for the Chicago, Rock Island & Pacific, and was then successively assistant general attorney, general attorney and general counsel for the road. He was also elected to various offices of that road, becoming second vice-president in 1889, first vice-president in April, 1904, chairman of the executive committee in October, 1904, and president of the Rock Island Company in the same year. In 1903 he was also elected third vice-president of the St. Louis & San Francisco, and in 1904 became first vice-president of that road. He was also first vice-president of the Chicago & Eastern Illinois and the Evansville & Terre Haute, and chairman of the board of directors of the St. Louis, Kansas City & Colorado. In January, 1909, at the time of the reorganization of the Westinghouse Electric & Manufacturing Company, Mr. Mather was elected chairman of the board of directors, and thereupon severed his railway connections. At the time of his death, Mr. Mather was director of the La Grange Mining Company, the S. S. McClure Company, the Equitable Life Assurance Society of the United States, the Mercantile Trust Company, the Havana Electric Railway Company, the Westinghouse Lamp Company, the Canadian Westinghouse Company, the R. D. Nuttall Company, the Niagara, Lockport & Ontario Power Company, the Perkins Electric Switch Manufacturing Company, the Bryant Electric Company, the National Bank of the Republic of Chicago, the Chicago, Rock Island & El Paso Railway, and general counsel of the Chicago & Alton. Mr. Maher belonged to the Bar Associations of Illinois and Chicago, the Chicago Club, and in New York City the Union League, Law, Metropolitan, Racquet and Tennis, Westchester Country, City Midday, Railroad, and Lawyers' Clubs.



Robert Mather

THE RICHMOND, FREDERICKSBURG & POTOMAC has ordered 2 six-wheel switching locomotives from the Baldwin Locomotive Works, and 4 Pacific type locomotives from the American Locomotive Company.

THE NEW YORK CENTRAL has ordered 20 freight locomotives from the Baldwin Locomotive Works, in addition to the 30 Pacific type locomotives, mentioned last week.

THE SOUTH MANCHURIAN RAILWAY has ordered 5 ten-wheel locomotives from the American Locomotive Company. The dimensions of the cylinders will be 19 in. x 24 in.; the diameter of the driving wheels will be 69 in., and the total weight in working order will be 158,000 lbs.

GUINLE & COMPANY, New York, have ordered 1 four-wheel switching locomotive from the American Locomotive Company. The dimensions of the cylinders will be 6 in. x 12 in.; the diameter of the driving wheels will be 24 in., and the total weight in working order will be 14,000 lbs.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS has ordered three Pacific type locomotives from the Baldwin Locomotive Works. The dimensions of the cylinders will be 23 in. x 28 in.; the diameter of the driving wheels will be 72 in., and the total weight in working order will be 253,000 lbs.

PORTER BROTHERS, Kansas City, Mo., have ordered two six-wheel switching locomotives from the Baldwin Locomotive Works. The dimensions of the cylinders will be 17 in. x 24 in.; the diameter of the driving wheels will be 43 in., and the total weight in working order will be 110,000 lbs.

CAR BUILDING.

THE BALTIMORE & OHIO is making inquiries for 1,500 gondola cars and 1,000 box cars.

THE PITTSBURGH COAL COMPANY, Pittsburgh, Pa., is in the market for 1,200 coal cars.

THE UNION TANK LINE has ordered 500 tank cars from the Pressed Steel Car Company.

THE WOODWARD IRON COMPANY, Birmingham, Ala., is making inquiries on from 50 to 100 coke cars.

THE ALGOMA CENTRAL & HUDSON BAY is making inquiries for 6 first-class coaches, 4 second-class coaches, 2 baggage cars and 50 box cars.

THE CHICAGO, ROCK ISLAND & PACIFIC is making inquiries for 500 Rodger Ballast cars, 500 automobile cars, 250 flat cars and 25 caboose cars.

THE PENNSYLVANIA, mentioned in the *Railway Age Gazette* of October 18 as having ordered 52 suburban passenger cars from the Pressed Steel Car Company, has increased this order to 65.

THE NEW YORK CENTRAL, mentioned in the *Railway Age Gazette* of October 6 as making inquiries for from 1,000 to 2,000 box cars, has ordered 2,000 box cars from the American Car & Foundry Company.

IRON AND STEEL.

GENERAL CONDITIONS IN STEEL.—Prices in the steel industry are believed to have reached rock bottom; they are now beginning to stiffen. The past week has witnessed a marked falling off in orders and the outlook is far from satisfactory. Mill operations are at about 75 per cent. of capacity, but an immediate reduction is certain. Steel men are trying to confine orders to early deliveries, because their policy in the great reduction of prices is to maintain a high rate of production until the end of the year. Orders for 1912 rail requirements are coming due and are depended on for mill operations during the first months of next year.

Supply Trade News.

Frank B. Goebler, formerly in the purchasing department of the Atchison, Topeka & Santa Fe, has been made manager of the Railway & Supplymen's Mutual Catalog Company, Chicago, with office in that city.

E. A. Johnson, eastern sales manager of the Duff Manufacturing Company, Pittsburgh, Pa., with office in New York, has been made general sales manager, with office in Pittsburgh, C. A. Methfessel succeeds Mr. Johnson.

The Lehon Company, Chicago, is supplying the insulating paper used in the construction of the 2,500 refrigerator cars now being built for the St. Louis & San Francisco by the American Car & Foundry Company, New York. This large order amounts to 20,000,000 sq. ft. of paper, and requires 40 cars to ship.

The Association of Railway Electrical Engineers will hold its annual convention at the Hotel LaSalle, Chicago, November 6-10 as noted in last week's issue. Twenty-nine booths ranging in size from 70 sq. ft. to 182 sq. ft., have been provided in the ball room on the nineteenth floor of the hotel. Inquiries concerning exhibits at this convention should be sent to W. E. Ballantine, 436 So. Dearborn street, Chicago.

TRADE PUBLICATIONS.

SPARK COILS.—The Nungesser Electric Battery Company, Cleveland, Ohio, has published Practical Pointers About Spark Coil Adjustment, a booklet giving useful data on dry batteries and spark coils.

TUBE EXPANDERS.—Gustav Wiedeke & Company, Dayton, Ohio, have issued bulletin No. 30 on tube expanders. This bulletin, which consists of 24 pages, describes the various types of expanders, and gives list prices of the different sizes.

DENVER & RIO GRANDE.—The passenger department of the Denver & Rio Grande has issued an illustrated pamphlet entitled The Land of Irrigation, giving panoramic views of the irrigated orchards and farms in the territory through which this road runs.

ASPHALT FLOORS.—The Standard Asphalt & Rubber Company, Chicago, has issued a booklet entitled Asphalt Floors, describing the floors furnished by this company for factories, railway stations, warehouses, etc., and giving illustrations of installations. This company has also published Permanent Waterproofing, a booklet treating of its products for waterproofing bridges, reservoirs and subways. Another booklet, Asphalt Products, lists other articles made by this company.

AIR COMPRESSORS.—The Ingersoll-Rand Company, New York, has published form 3109, on class NF-1, steam-driven, single-stage, straight-line air compressors, and form 3210, on class NE-1, power-driven, single-stage, straight-line air compressors. The steam driven compressors consist of a twin flywheel, center crank, with the steam and air cylinders arranged in tandem. The power-driven compressors consist of an air cylinder, supported by a main frame, with a piston operated by a center crank shaft, having a belt wheel on one side and a flywheel on the other. The booklets show several views of these machines in section and include tables of sizes and capacities.

LOCOMOTIVES.—The American Locomotive Company, New York, has issued bulletin No. 1011, entitled An Epoch Making Passenger Locomotive. Two of these locomotives were built for the Chesapeake & Ohio to replace the Pacific type engines which previously handled the passenger traffic over the Clifton Forge division. They have the 4-8-2 wheel arrangement, and have been named the mountain type. They are the largest passenger engines of the rigid frame construction ever built, and include interesting special features in their construction. The bulletin includes reports of the operation of these engines, both in trial service and in passenger service on their regular runs, which shows that they will haul 645 tons over 1.82 per cent. grades at 26 miles per hour. The important dimensions of these engines are also compared with the dimensions of the Pacific type locomotives which they replaced.

Railway Construction.

New Incorporations, Surveys, Etc.

ARANSAS PASS CHANNEL & DOCK CO.—An officer writes that this company has not yet definitely secured the right of way for the proposed improvements to be made at Aransas Pass, Tex. Under the name of the Aransas Harbor Terminal, six miles of line are to be built from the mainland at Aransas City, east to Harbor Island. The company has already laid about three-quarters of a mile of track, and has grading finished on about five miles; 8,000 ft. of fill is partly finished; this work is to be completed across a shallow bay, and calls for handling about 32,000 cu. yds. There will be 500 ft. of trestle and a plate girder drawbridge with a 40-ft. opening; also a 600-ft. dock and warehouse. T. H. Franklin, president, San Antonio, Tex. (See Aransas Terminal, Jan. 27, p. 183.)

CANADIAN NORTHERN.—Application will be made to the Alberta legislature for permission to build 14 new lines in that province. One of the most important of these lines is to be built from Athabasca Landing to Peace river crossing. T. Turnbull, assistant chief engineer, Winnipeg, Man.

CANADIAN PACIFIC.—A contract has been given to Burns & Johnson, it is said, to build from Fort Steele, B. C., to Skookumchuck, 60 miles. J. G. Sullivan, chief engineer, Winnipeg, Man.

CHESAPEAKE & OHIO.—The report of this company for the year ended June 30, 1911, shows that work is nearing completion on extensions as follows: Raleigh & Southwestern, 14.6 miles; Coal River branch, 11.2 miles; Guyandotte Valley branch, 12.4 miles, and on the Buffalo Creek branch, 11.5 miles. Second track work has been completed as follows: Walker, Va., to Elko, 15.8 miles; Korah to Westham, 3 miles; Gladstone to Riverville, 3 miles; Fort Spring, W. Va., to Rockland, 2.1 miles; Riverton, Ky., to South Portsmouth, 19 miles; Quicks' Run to Robtown, 13.5 miles; Manchester to Crooked Creek, 3.3 miles; Carntown, Ky., to Brent, 19.9 miles; a total of 79.6 miles. Of the 67 miles of second track on the Cincinnati division, authorized in 1910, 12 miles were not completed at the end of the fiscal year, and construction of 48 miles additional, to complete the double-track on this division, has been authorized. About 30 miles of this work has been finished since the close of the fiscal year, and it is expected to have the entire 60 miles in operation by December, 1911. During the year the company put in 20,110 tons of new rail, equal to 140 track miles, which was used in renewal of existing main tracks. H. Pierce, chief engineer, Richmond, Va.

CHICAGO, BURLINGTON & QUINCY.—The report of this company for the year ended June 30, 1911, shows that the Herrin & Southern, from Herrin, Ill., to Metropolis, was opened for operation in October, 1910. The line from Scribner, Mont., to Fromberg, where connection is made with the Northern Pacific, was opened for traffic in April, 1911, and on the extension from Kirby, Wyo., to Powder River, a section of 12 miles from Kirby to Thermopolis, is in operation; track has been laid on 14 miles south of Thermopolis, and grading is almost finished on 82 miles additional. Work on the Hudson-Greeley line, Colo., has not been pushed, and the money spent during the past year for this improvement was principally for the right-of-way. A large amount of second track has been laid at various points, and new freight and passenger stations rebuilt or enlarged. Additional land has been bought for improved facilities at St. Louis, Mo., and at Denver, Colo. Improvements at the Havelock's shops at Havelock, Neb., have been completed, and a site has been bought in Chicago, on which a new building, to accommodate the general offices, is now being put up. T. E. Calvert, chief engineer, Chicago.

GREAT NORTHERN.—According to press reports, Coughren & Woldson, Spokane, Wash., have been given a contract for excavating and grading work from Bluestem to Peach, about 45 miles. This work has been sublet as follows: O. D. Wolf, Seattle, 10 miles; P. P. Johnson, Spokane, 7 miles; S. J. Dalberg, Spokane, 8 miles; Burpee & Elliott, Portland, Ore., 2 miles; O. E. Grant, Spokane, 5 miles; N. A. Degrestrom, Everett, 2 miles; Ehrlicson & Olson, Spokane, 4 miles; Boynston, Church & McCoy, Spokane, 7 miles; A. H. Hogeland, chief engineer, St. Paul, Minn.

KAUL'S LUMBER COMPANY'S LINES.—An officer writes that a contract has been let to P. W. Turner, Birmingham, Ala., to build a line southeast from Tuscaloosa, about 25 miles. Minimum grades will be $1\frac{1}{2}$ per cent. and minimum curvature 8 deg. The line is being built to carry lumber. John L. Kaul, president, Birmingham, Ala.

MARSHALL & EAST TEXAS.—This company is planning to build important extensions, it is said, to include one from Elysian Fields, Tex., south to Newton, about 120 miles, where connection is to be made with the Orange & Northwestern. It is also planned to build an extension from Winsboro, north to Paris, about 50 miles. R. J. Lockwood, chief engineer, Marshall. (March 10, p. 479.)

MISSOURI, KANSAS & TEXAS.—This company has started the reconstruction of its main line from the Texas state line at Red river northward to Kansas City and St. Louis. The road, originally constructed on a 1 per cent. grade, uncompensated for curvature, is being double-tracked and reconstructed on a 0.4 per cent. grade compensated, from the south line of Oklahoma as far as Wagoner, and work is projected from there to Paola, near Kansas City, on a 0.3 per cent. grade. At present 53 miles of this work has been completed and put in operation. On the line from Stringtown to McAlester three heavy grades will have to be reduced. The line from Parsons, Kan., to Atoka, Okla., 223 miles, will be double-tracked. It is contemplated to extend the double-track northward from its present terminus at Stringtown to Parsons, Kan. This will make a double-track line from Denison, Tex., to Parsons, Kan.

MISSOURI, OKLAHOMA & GULF.—An officer writes that a locating party is making surveys between Wagoner, Okla., and Pittsburg, Kan., and Joplin, Mo. The line has been located from Wagoner north to Horsecreek, 60 miles, and the preliminary survey has been made from Horsecreek north to Pittsburg and Joplin. A locating party is also working west between Henryetta, Okla., and Oklahoma City. The line has been located to Shawnee and it is expected that this will be finished to Oklahoma City within 30 days. Two location parties are in the field between Denison, Tex., and Fort Worth, and Dallas. A preliminary survey has been made from Denison to Dallas, and in a few days will be started from Denison, via McKenney, to Fort Worth. The company's plans for construction in Texas are not yet complete and when surveys are finished they will decide which lines are to be built. The three lines above aggregate between 250 and 300 miles. It is expected that construction work will be begun as soon as the survey and plans are completed. J. J. Harrison, chief engineer, Muskogee, Okla.

MORGAN'S LOUISIANA & TEXAS.—This company will begin operating freight trains between La Fayette, La., and Baton Rouge, 57.38 miles, on November 5. E. B. Cushing, chief engineer, Houston, Tex.

NEVADA-CALIFORNIA-OREGON.—An officer writes that the company expects to have all the work finished to complete the line from Reno, Nev., north via Alturas, Cal., to Lake View, Ore., 237 miles, and the line in operation by December 1. George S. Oliver, chief engineer, Reno, Nev. (October 20, p. 816.)

NORFOLK & WESTERN.—The report of this company for the year ended June 30, 1911, shows that the Petersburg Belt Line, which extends from Poe, Va., to Addison, comprising 8.87 miles of main line, and 1.69 miles of connecting tracks and 4.06 miles of sidings, has been opened for operation. The Dry Fork branch and connections, has been extended to operation No. 4 of the New River and Pocahontas Consolidated Coal Companies, and now has a total length of 30.11 miles. Work is now under way on 1.04 miles from the present end of track, above Canebrake, W. Va., to the Beech Creek branch. Work is also under way on the Beech Creek branch from the Dry Fork branch to a connection with the Indian Creek branch, at the Virginia state line, 1.56 miles. The Indian Creek branch is now under construction from connections with the Beech Creek branch and at the West Virginia state line to Cedar Bluff, Va., 12.22 miles; and a "Y" connection is also to be built at Cedar Bluff, 0.37 miles. It is expected to have all this work finished by 1912, and these improvements will provide connections between the main line at

Iaeger, W. Va., with the Clinch Valley district at Cedar Bluff, Va. Work is now under way on the North Fork branch of Tug Fork branch, from Jeanette, W. Va., 4.31 miles, and it is expected to be finished about November, 1911. The Sycamore branch has been put in operation from a point 2.8 miles east of Williamson, W. Va., up Sycamore Creek to the coal operation of the Sycamore Coal Company, 2.69 miles. The Winston-Salem southbound, which was built jointly by the Norfolk & Western and the Atlantic Coast Line, from Winston-Salem, N. C., to Wadesboro, 89 miles, has been completed and is now opened for operation. Further progress is being made in securing the right-of-way for the Guyandotte and Tug River Railroad, and connections. Double-track work is now under way from Vivian, W. Va., to Huger, 5.03 miles, including four tunnels, and it is expected to be finished during November, 1911. The grade of the east approach of the Ohio river bridge at Kenova, W. Va., is being reduced from 0.5 per cent. to 0.3 per cent., and the viaduct and bridge will be double-tracked, removing 0.7 miles of gauntlet. It is expected that this work will be finished late in 1912. When these improvements are completed the company will have, between Lambert's Point, Va., and Columbus, Ohio, including as second track the lines around Petersburg, Va., and Lynchburg and the big Sandy line, 512.09 miles of double main track, and 191.67 miles of single track, including two gauntlets, 0.38 and 0.55 miles respectively. A single track is between Gilmerston and Phoebe, 172.06 miles; between Radford and Coaldale, W. Va., in sections, 16.46 miles, and between the Pocahontas coal field and Columbus, Ohio, 3.15 miles.

OREGON ELECTRIC.—A contract has been given to Guthrie & McDougall, it is said, for grading 20 miles between Albany, Ore., and Eugene. The work has been sublet to Fuller & Bain. These contractors are now building the line from Salem to Albany. L. B. Wickersham, chief engineer, Portland, Ore.

PIEDMONT & NORTHERN (Electric).—An officer writes that contracts have been let to W. J. Oliver and to Stuart & Jones to build from Charlotte, N. C., west to Gastonia, 23 miles; also to build from Greenwood, S. C., north to Greenville, 60 miles, with a branch of this line from a point south of Belton west to Anderson, 10 miles; in all 93 miles. The plans also call for building a connecting line from Greenville, S. C., northeast to Gastonia, N. C., and an extension from Charlotte northeast, via Greensboro, to Durham. Work is now under way and track has been laid on six miles. J. B. Duke, president; W. S. Lee, vice-president; E. Thomason, assistant vice-president and general manager, Charlotte, N. C.

ROCKINGHAM RAILROAD.—This road is now in operation from Gibson, N. C., to Rockingham, 19 miles. J. L. Hawley, superintendent, Rockingham.

SANTA FE, PRESCOTT & PHOENIX.—According to press reports, a contract has been given to build from Cedar Glade, Ariz., through the Verde valley, to Jerome, 38 miles. J. A. Jaeger, chief engineer, Prescott. (July 14, p. 105.)

TERRE HAUTE & OHIO RIVER.—Incorporated in Illinois with \$100,000 capital, to build from Clark county, Ill., opposite Terre Haute, to Elizabethtown in Hardin county on the Ohio river. The incorporators are residents of Chicago. It is understood that the Frisco interests are back of the project.

RAILWAY STRUCTURES.

CAMERON, TEX.—The Gulf, Colorado & Santa Fe is preparing plans for a one-story brick passenger station.

CLARKSBURG, W. VA.—An officer of the Baltimore & Ohio writes, regarding the improvements to be carried out at Clarksburg, that the company will shortly erect umbrella sheds at the passenger station, and next spring will build an extension to the freight houses. (October 20, p. 816.)

CLARKSON, WASH.—It is understood that the Oregon-Washington Railroad & Navigation Company will soon start work on a bridge over the Snake river, near Clarkson.

CULLMAN, ALA.—The Louisville & Nashville will build a reinforced concrete and brick passenger station, to cost approximately \$50,000. The work will probably be done by company forces.

FAIR OAKS, ARK.—The St. Louis Southwestern will build a passenger station 20 ft. x 70 ft., to replace the structure recently destroyed by fire.

KANSAS CITY, KAN.—The Union Pacific is preparing plans for a reinforced concrete viaduct over Mill street, Kansas City, to cost about \$90,000.

KANSAS CITY, Mo.—The Kansas City Terminal Company has let contracts to the W. P. Carmichael Co., Kansas City, for building a retaining wall east of Brooklyn avenue, and to O'Hagan & Lake, Aurora, Ill., for the subway at Independence Road. The Freeborn Engineering Company, Kansas City, has secured the contract amounting to \$35,000 for the concrete abutments for a viaduct on Eighteenth street, near Agnes avenue. It is expected that the contracts for the Burlington connection, by which trains arriving over the Hannibal bridge can enter the new station, involving about \$350,000, and for the foundations and piers for the bridge over the Blue river on the North Side freight line, amounting to about \$50,000, will be let within a week. The Burlington connection will extend from St. Louis avenue to Twenty-fourth street, and will include the excavation of about 200,000 cu. yds. of earth, the construction of a retaining wall, foundations for the subway on West Twelfth street and a viaduct at Allen avenue. The Terminal Company will lay the tracks when the grading work has been completed.

LUDLOW, KY.—The Queen & Crescent has let the contract to the American Bridge Company for an 80-ft. electric turntable, designed to turn locomotives of 180 tons weight. The electric tractor will be furnished by G. P. Nichols & Bros.

MOUNT VERNON, WASH.—The Bellingham & Skagit Interurban Railway, in connection with building a line into Mount Vernon, will soon start work erecting a bridge over the Skagit river.

NORFOLK, VA.—The report of the Norfolk & Western for the year ended June 30, 1911, shows that land for the terminal facilities at Norfolk, Va., has been secured and contracts for putting up the station and office building have been let and work is now under way. The Norfolk Terminal Railway was organized to carry out these improvements. The Norfolk & Western, the Virginia Railway and the Norfolk Southern will jointly use the terminal facilities of the Norfolk Terminal for their passenger train business to and from Norfolk. It is expected that the terminal will be ready for use about the middle of 1912. The total cost of the work is estimated at \$950,000. During the year passenger stations and freight houses were built or enlarged at Woodsdale, N. C., Thaxton, Va., Berryville, Basic, Troutville, Holland, Catawba, East Radford, Abingdon and at Plasterco, Delorme, W. Va., and at Chillicothe, Ohio. Small joint freight houses were built at Riverton, Va., and at Devon, W. Va. A three story brick office building, for the motive power department, was constructed and a brick power house, 72 ft. x 104 ft., was built at Roanoke, Va. At Bluefield, W. Va., a three story addition was built to the division office building, and the power house was extended and the boiler plant enlarged. At Norfolk, Va., a coal wharf was built. During the year, 330 lineal ft. of wooden bridges and 93 lineal ft. of iron bridges were replaced by masonry, culverts, and fill; 284 lineal ft. of wooden bridges and 2,897 lineal ft. of iron bridges were replaced by steel structures, and 896 lineal ft. of wooden bridges at branch lines were replaced by iron bridges released from the main line. New overhead steel highway bridges were built at Dwight, Va., Basic, Elmwood, Ohio, Dorney and Delano. Twelve double-track bridges, two in Virginia and 10 in Ohio, have been constructed over county roads, depressed to eliminate grade crossings. A number of water tanks, also water softening plants were constructed, and improvements were made to the water supply at various places during the year.

PASADENA, CAL.—Plans are being made by the San Pedro, Los Angeles & Salt Lake, for building an addition to the fruit packing house at Pasadena, it is said, and for building new packing houses at Fourth street and at Pacific avenue, Riverside.

PORTOLA, CAL.—The Western Pacific has started work on a hospital at Portola, Cal., it is said, for the use of its employees.

RIVERSIDE, CAL.—See Pasadena, Cal.

WICHITA, KAN.—The Midland Valley has let the contract for building a brick engine house at Wichita.

Railway Financial News.

ALABAMA GREAT SOUTHERN.—Robert Jamison has been elected a director, succeeding W. H. Woodward, deceased.

BALTIMORE & OHIO.—Paul M. Warburg, of Kuhn, Loeb & Co., New York, has been elected a director, succeeding J. R. Foard, deceased.

BOSTON & MAINE.—The Concord & Montreal has applied to the Massachusetts Railroad Commission for permission to issue \$400,000 new stock. This stock is to be sold at auction and the proceeds used to reimburse the Boston & Maine for expenditures under the Boston & Maine's 99-year lease.

CANADIAN NORTHERN.—See Carillon & Greenville.

CARILLON & GREENVILLE.—A special meeting was held on October 18 "to authorize and confirm a sale or transfer of the company's charter and all the rights to property, land grants and franchises to the Central Railway of Canada." After the meeting no statement was given out as to what had taken place, and no explanation was offered of a rumor originating some time ago that control of this company was held by the Canadian Northern. The road runs from Carillon, northwest of Montreal, to Greenville, about 13 miles. The right of way in general lies along a part of the route that is proposed for the Central Railway between Montreal and Ottawa.

CENTRAL RAILWAY OF CANADA.—See Carillon & Greenville.

CHESAPEAKE & OHIO.—T. H. Hubbard has been elected a director succeeding F. W. Scott.

CHICAGO GREAT WESTERN.—Stockholders of the De Kalb & Great Western are to vote on December 1 on the question of the sale of the property and franchises to the Chicago Great Western.

CINCINNATI, HAMILTON & DAYTON.—This company has asked the Ohio State Railway Commission for authority to issue \$400,000 bonds, of which \$200,000 are to be used to retire outstanding securities and the remainder to be used for extensions and betterments.

DE KALB & GREAT WESTERN.—See Chicago Great Western.

DENVER, NORTHWESTERN & PACIFIC.—The Denver Railway Securities Company is offering to holders of the Colorado Utah Construction Company's \$4,000,000 guaranteed 2-year 6 per cent. notes to pay \$125 in cash and \$875 in purchase money collateral trust 6 per cent. notes of the Denver Railway Securities Company for each \$1,000 construction company note. The construction company was building the Denver, Northwestern & Pacific, and its notes were secured by D. N. W. & P. bonds and were guaranteed by the late David H. Moffat.

DENVER RAILWAY SECURITIES CO.—See Denver, Northwestern & Pacific.

MARSHALL & EAST TEXAS.—J. W. Ogburn and J. E. Votaw have been elected directors, succeeding J. J. Carter and J. F. Strickland.

MEXICAN INTERNATIONAL.—Jaime Gurza and J. L. Moctezuma have been elected directors, succeeding G. De S. Escandon and Pablo Macedo, retired.

MISSOURI, KANSAS & TEXAS.—It is understood that the sale of the Wichita Falls & Northwestern and the Wichita Falls & Southern to the Missouri, Kansas & Texas has been finally concluded.

RUTLAND.—The board of directors, representing the joint control of this company by the New York Central & Hudson River and the New York, New Haven & Hartford, have been elected as follows: W. C. Brown, Charles S. Mellen, Lewis Cass Ledyard, William Skinner, J. P. Morgan, William Rockefeller, James Stillman, W. H. Newman, George F. Baker, W. K. Vanderbilt, Jr., W. Seward Webb, Percival W. Clement and E. R. Morse. Mr. Morse was elected as successor to the late Governor Proctor of Vermont.

WICHITA FALLS & NORTHWESTERN.—See Missouri, Kansas & Texas.

WICHITA FALLS & SOUTHERN.—See Missouri, Kansas & Texas.

ANNUAL REPORTS

FIFTY-SEVENTH ANNUAL REPORT OF THE CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY.

Chicago, July 1, 1911.

To the Stockholders of the Chicago, Burlington & Quincy Railroad Company:

The following is the report of your Board of Directors for the year ended June 30th, 1911:

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY,
YEARS ENDED JUNE 30.

| Per Cent. | 1911. | OPERATING REVENUES. | 1910. | Per Cent. |
|--------------|-----------------|--|-----------------|--------------|
| 65.74 | \$58,033,242.91 | Freight Revenue | \$58,224,537.48 | 66.26 |
| 25.55 | 22,552,567.22 | Passenger Revenue | 22,380,305.83 | 25.47 |
| 2.69 | 2,375,713.68 | Mail Revenue | 2,330,215.66 | 2.65 |
| 2.83 | 2,493,252.45 | Express Revenue | 2,216,049.24 | 2.52 |
| 2.13 | 1,879,828.61 | Miscellaneous Transportation Revenue | 1,803,949.06 | 2.05 |
| .94 | 832,357.32 | Revenue from Operations other than Transportation | 812,440.69 | .93 |
| .12 | 105,246.08 | Joint Facilities | 102,019.28 | .12 |
| 100.00 | \$88,272,208.27 | Total Operating Revenue | \$87,869,517.24 | 100.00 |
| | | OPERATING EXPENSES. | | |
| | | Maintenance of Way and Structures | \$15,725,461.20 | 17.90 |
| 14.05 | \$12,406,278.81 | Maintenance of Equipment | 15,057,165.39 | 17.14 |
| 16.72 | 14,761,137.51 | Traffic Expenses | 1,654,451.73 | 1.88 |
| 1.79 | 1,581,805.25 | Transportation Expenses | 28,340,051.74 | 32.25 |
| 32.34 | 28,543,204.54 | General Expenses | 2,233,834.82 | 2.54 |
| 2.55 | 2,249,499.55 | Total Operating Expenses | \$63,010,964.88 | 71.71 |
| 67.45 | \$59,541,925.66 | Net Operating Revenue | \$24,858,552.36 | 28.29 |
| 32.55 | \$28,730,282.61 | Net Deficit from Outside Operations | 164,282.15 | |
| | | Total Net Revenue | \$24,694,270.21 | |
| | | Taxes Accrued | 2,970,736.78 | |
| | | Operating Income | \$21,723,533.43 | |
| | | OTHER INCOME. | | |
| | | Rents | \$745,786.35 | |
| | | Miscellaneous Interest | 1,777,907.46 | |
| | | Total Other Income | \$2,523,693.81 | |
| | | Gross Corporate Income | \$24,247,227.24 | |

TRAFFIC AND OPERATING STATISTICS.

ITEM.

PASSENGER TRAFFIC.

| | |
|--|--|
| Number of Passengers Carried Earning Revenue..... | |
| Number of Passengers Carried One Mile..... | |
| Number of Passengers Carried One Mile, per Mile of Road..... | |
| Average Distance Carried, Miles..... | |
| Total Passenger Revenue..... | |
| Average Amount Received from each Passenger..... | |
| Average Receipts per Passenger per Mile..... | |
| Total Passenger Service Train Revenue..... | |
| Passenger Service Train Revenue per Mile of Road..... | |
| Passenger Service Train Revenue per Train Mile..... | |

FREIGHT TRAFFIC.

| | |
|--|--|
| Number of Tons Carried of Freight Earning Revenue..... | |
| Number of Tons Carried One Mile..... | |
| Number of Tons Carried One Mile per Mile of Road..... | |
| Average Distance Haul of One Ton, Miles..... | |
| Total Freight Revenue..... | |
| Average Amount Received for each Ton of Freight..... | |
| Average Receipts per Ton per Mile..... | |
| Freight Revenue per Mile of Road..... | |
| Freight Revenue per Train Mile..... | |

OPERATING.

| | |
|---|--|
| Operating Revenue | |
| Operating Revenues per Mile of Road | |
| Operating Revenues per Train Mile | |
| Operating Expenses | |
| Operating Expenses per Mile of Road | |
| Operating Expenses per Train Mile | |
| Net Operating Revenue | |
| Net Operating Revenue per Mile of Road | |
| Average Number of Passengers per Car Mile | |
| Average Number of Passengers per Train Mile | |
| Average Number of Passenger Cars per Train Mile | |
| Average Number of Tons of Freight per Loaded Car Mile | |
| Average Number of Tons of Freight per Train Mile | |
| *Average Number of Freight Cars per Train Mile | |
| Average Number of Loaded Cars per Train Mile | |
| Average Number of Empty Cars per Train Mile | |
| Average Mileage Operated During Year | |

*Including cabooses.

DEDUCTIONS FROM GROSS
CORPORATE INCOME.

| | | |
|-----------------|---------------------------------------|-----------------|
| \$1,610,636.54 | Rents | \$1,764,512.90 |
| 3,702.07 | Miscellaneous Interest | 1,077.95 |
| 8,626,369.54 | Interest Accrued on Funded Debt | 8,506,015.82 |
| 662,310.50 | Sinking Funds | 666,874.39 |
| 1,986.80 | Discount on Funded Debt | |
| \$10,905,005.45 | Total Deductions | \$10,938,481.06 |
| \$16,843,762.73 | Net Corporate Income | \$13,308,746.18 |
| \$8,867,128.00 | Dividends | \$8,867,128.00 |
| 4,826,755.01 | Appropriations for Betterments | 3,329,006.47 |
| \$13,693,883.01 | | |
| \$3,149,879.72 | Surplus for the Year | \$1,112,611.71 |

Charges to capital account aggregating \$11,031,462.31 were made during the fiscal year for additions to the property.

The Herrin and Southern Line from Herrin to Metropolis, Ill., was opened for business on October 15th, 1910, the amount expended on it this year being \$732,338.04. Arrangements have been made by which freight via this line is transferred across the Ohio River to Paducah, Ky., forming a connection with southern roads. This, in time, should lead to increased revenue.

The line from Scribner to Fromberg, Mont., where it connects with the Northern Pacific Road, was opened for traffic on April 24th, 1911. Amount expended on it during the year was \$953,050.73.

On the extension from Kirby to Powder River, Wyo., \$2,255,527.96 has been expended this year, and twelve miles from Kirby to Thermopolis, Wyo., are in operation. Track is laid for fourteen miles south of Thermopolis, and grading almost finished on eighty-two miles more.

Work on the Hudson-Greeley line, Colorado, has not been pushed, and the \$53,104.76 expended on it during the past year was principally for right of way.

Additional land was purchased for needed facilities at St. Louis and Denver, and the improvements at Havelock Shops were completed.

New second track costing \$1,312,650.16 has been laid at various points, and new freight and passenger stations rebuilt or enlarged where business required it.

Owing to changed conditions, the accommodations of the General Offices at Chicago have for some time been inadequate for the use required, and a site has been purchased on which a new building, designed to meet future expansion, is being erected.

The following statistical tables, together with the report of the General Auditor, reflect the business of the Company during the year:

| 1911. | 1910. | Increase or Decrease. | | | |
|----------------------------------|---------------------------|----------------------------------|---------------------------|----------------------------------|---------------------------|
| Dollars and Whole Numbers. | Cents and Decimals. | Dollars and Whole Numbers. | Cents and Decimals. | Dollars and Whole Numbers. | Cents and Decimals. |
| 22,014,305 | ..... | 21,512,255 | ..... | Inc. | 502,050 |
| 1,173,435,093 | ..... | 1,189,871,613 | ..... | Dec. | 16,436,520 |
| 129,350 | ..... | 131,870 | ..... | Dec. | 2,520 |
| 53 | 30 | 55 | 31 | Dec. | 2 01 |
| \$22,552,567 | 22 | \$22,380,305 | 83 | Inc. | 172,261 |
| \$1 | 02445 | \$1 | 04035 | Dec. | 01590 |
| 01922 | . | 01881 | . | Inc. | 00041 |
| \$28,112,771 | 17 | \$27,566,795 | 71 | Inc. | \$545,975 |
| \$3,098 | 92 | \$3,055 | 15 | Inc. | 43 77 |
| \$1 | 54401 | \$1 | 51109 | Inc. | 03292 |
| 28,328,338 | ..... | 27,867,618 | ..... | Inc. | 460,720 |
| 7,116,005,120 | ..... | 7,435,144,216 | ..... | Dec. | 319,130,096 |
| 784,409 | ..... | 824,016 | ..... | Dec. | 39,607 |
| 251 | 20 | 266 | 80 | Dec. | 15 60 |
| \$58,033,242 | 91 | \$58,224,537 | 48 | Dec. | 191,294 |
| \$2 | 04859 | \$2 | 08933 | Dec. | 04074 |
| 00816 | . | 00783 | . | Inc. | 00033 |
| \$6,397 | 10 | \$6,452 | 86 | Dec. | 55 76 |
| \$3 | 31378 | \$2 | 98566 | Inc. | 32812 |
| \$88,272,208 | 27 | \$87,869,517 | 24 | Inc. | \$402,691 |
| \$9,730 | 40 | \$9,738 | 33 | Dec. | \$7 93 |
| \$2 | 53455 | \$2 | 38445 | Inc. | 15010 |
| \$59,541,925 | 66 | \$63,010,964 | 88 | Dec. | \$3,469,039 |
| \$6,563 | 41 | \$6,983 | 33 | Dec. | \$419 92 |
| \$1 | 70962 | \$1 | 70988 | Dec. | 00026 |
| \$28,730,282 | 61 | \$24,858,552 | 36 | Inc. | \$3,871,730 |
| \$3,166 | 99 | \$2,755 | 00 | Inc. | \$411 99 |
| 16 | ..... | 16 | ..... | ..... | ..... |
| 64 | ..... | 65 | ..... | Dec. | 1 1 |
| 6 | 15 | 6 | 02 | Inc. | 13 |
| 17 | 21 | 16 | 99 | Inc. | 22 |
| 406 | 33 | 381 | 26 | Inc. | 25 07 |
| 34 | 71 | 32 | 66 | Inc. | 2 05 |
| 23 | 61 | 22 | 44 | Inc. | 1 17 |
| 10 | 15 | 9 | 28 | Inc. | 87 |
| 9,071 | 80 | 9,023 | 06 | Inc. | 48 74 |

FUNDED DEBT OF THE CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY.

| Designation of Bond or Obligation. | TERM. | | Total Par Value Held by Company. | | Total Par Value not Held by Company. | | INTEREST. | | | |
|--|----------------|-------------------|----------------------------------|------------------------------|--------------------------------------|------------------------|-------------------|-----------------------------|---------------|---------------------------------|
| | Date of Issue. | Date of Maturity. | Total Par Value Authorized. | Total Par Value Outstanding. | In Treasury. | Pledged as Collateral. | In Sinking Funds. | In the Hands of the Public. | When Payable. | Amount Accrued During the Year. |
| MORTGAGE BONDS. | | | | | | | | | | |
| C. B. & Q. R. R.: | | | | | | | | | | |
| General Mortgage | 1908 | 1958 | \$59,723,000 | \$59,723,000 | \$8,204,000 | ..... | ..... | \$51,519,000 | 4 | M. & S. |
| Illinois Division | 1899 | 1949 | 50,835,000 | 50,835,000 | 384,000 | ..... | ..... | 50,451,000 | 3½ | J. & J. |
| Illinois Division | 1899 | 1949 | 34,165,000 | 34,165,000 | 189,000 | ..... | ..... | 33,976,000 | 4 | J. & J. |
| Iowa Division Mortgage Sinking Fund Bonds..... | 1879 | 1919 | 3,000,000 | 2,275,000 | ..... | ..... | ..... | 2,275,000 | 5 | A. & O. |
| Iowa Division Mortgage Sinking Fund Bonds..... | 1879 | 1919 | 12,502,000 | 5,869,000 | 20,000 | ..... | ..... | 5,849,000 | 4 | A. & O. |
| Nebraska Extension Mortgage Sinking Fund Bonds..... | 1887 | 1927 | 29,441,000 | 22,839,000 | 300,000 | \$31,000 | ..... | 22,508,000 | 4 | M. & N. |
| B. & M. R. R. in Nebraska: Consolidated Mortgage Sinking Fund Bonds..... | 1878 | 1918 | 13,751,000 | 13,613,000 | 113,000 | ..... | \$9,527,000 | 3,973,000 | 6 | J. & J. |
| Republican Valley R. R.: Mortgage Sinking Fund Bonds | 1879 | 1919 | 2,643,000 | 932,800 | ..... | ..... | 684,800 | 248,000 | 6 | J. & J. |
| Hannibal & St. Joseph R. R.: Mortgage Bonds | 1881 | 1911 | 8,000,000 | ..... | ..... | ..... | ..... | ..... | 6 | M. & S. |
| Tarkio Valley R. R.: Mortgage Bonds | 1880 | 1920 | 430,000 | 33,000 | ..... | ..... | ..... | 33,000 | 7 | J. & D. |
| Nowadaway Valley R. R.: Mortgage Bonds | 1880 | 1920 | 388,000 | 37,000 | ..... | ..... | ..... | 37,000 | 7 | J. & D. |
| COLLATERAL TRUST BONDS. | | | | | | | | | | |
| C. B. & Q. R. R.: | | | | | | | | | | |
| Sinking Fund Bonds (Denver Extension) | 1881 | 1922 | 7,968,000 | 7,310,200 | 56,200 | ..... | 4,607,900 | 2,646,100 | 4 | F. & A. |
| PLAIN BONDS. | | | | | | | | | | |
| C. B. & Q. R. R.: | | | | | | | | | | |
| Sinking Fund Bonds..... | 1881 | 1921 | 4,300,000 | 3,667,000 | 52,000 | ..... | 2,570,000 | 1,045,000 | 4 | M. & S. |
| Plain Bonds | 1883 | 1913 | 9,000,000 | 8,510,000 | ..... | ..... | ..... | 8,510,000 | 5 | M. & N. |
| Total ..... | .... | .... | \$236,146,000 | \$209,809,000 | \$9,318,200 | \$31,000 | \$17,389,700 | \$183,070,100 | ... | \$8,626,369.54 |

CAPITALIZATION.

CAPITAL STOCK.

| Number of Shares. 1,108,391 | Total Par Value Authorized and Outstanding. \$110,839,100.00 | Dividends Declared During the Year. | |
|--------------------------------|--|-------------------------------------|---------------------------|
| | | Rate. 8% | Amount. \$8,867,128.00 |

FUNDED DEBT.

TOTAL PAR VALUE.

| Description of Bond. | Authorized. | Outstanding. | In Treasury, in Sinking Funds or Pledged as Collateral. | In Hands of Public. | Interest Accrued During Year. |
|----------------------|---------------|---------------|---|---------------------|-------------------------------|
| Mortgage | \$214,878,000 | \$190,321,800 | \$19,452,800 | \$170,869,000 | \$7,761,781.56 |
| Collateral Trust | 7,968,000 | 7,310,200 | 4,664,100 | 2,646,100 | 292,408.00 |
| Plain or Debenture | 13,300,000 | 12,177,000 | 2,622,000 | 9,555,000 | 572,179.98 |
| Total | \$236,146,000 | \$209,809,000 | \$26,738,900 | \$183,070,100 | \$8,626,369.54 |

EXPENDITURES FOR NEW LINES AND EXTENSIONS AND EQUIPMENT, AND FOR ADDITIONS AND BETTERMENTS, DURING THE YEAR.

| ACCOUNT. | New Lines and Extensions. | Charged to Road and Equipment. | Charged to Income. | Total Expenditure. |
|---|---------------------------|--------------------------------|--------------------|--------------------|
| I.—ROAD. | | | | |
| Engineering | \$154,390.29 | \$40,686.36 | \$35,742.07 | \$230,818.72 |
| Right of Way and Station Grounds | 66,729.17 | 1,863,826.74 | ..... | 1,930,555.91 |
| Real Estate | | Cr. 9,962.86 | | Cr. 9,962.86 |
| Grading | 2,042,893.53 | 334,058.52 | 341,200.07 | 2,718,242.12 |
| Tunnels | 111,311.69 | | | 111,311.69 |
| Bridges, Trestles and Culverts | 377,204.05 | 227,107.48 | 617,899.71 | 1,222,211.24 |
| Ties | 285,254.98 | 279,587.55 | 3,164.31 | 568,006.84 |
| Rails | 419,520.53 | 542,774.40 | 381,812.89 | 1,344,107.82 |
| Frogs and Switches | 15,762.90 | \$1,426.28 | 11,368.36 | 98,557.54 |
| Track Fastenings and Other Material | 144,804.78 | 107,412.04 | 222,228.80 | 474,445.62 |
| Ballast | 173,110.78 | 78,719.94 | 85,381.35 | 337,212.07 |
| Track Laying and Surfacing | 115,351.87 | 300,632.25 | 78,227.22 | 494,211.34 |
| Roadway Tools | 309.26 | 1,148.90 | 30.15 | 1,488.31 |
| Fencing Right of Way | 16,677.80 | 10,045.15 | 89.56 | 26,812.51 |
| Crossings and Signs | 5,062.40 | 10,976.10 | 197,215.64 | 213,254.14 |
| Interlocking and other Signal Apparatus | 13,004.74 | 53,372.50 | 47,897.74 | 114,274.98 |
| Telegraph and Telephone Lines | 40,034.76 | 10.17 | 33,906.97 | 73,931.56 |
| Station Buildings and Fixtures | 32,600.52 | 124,746.54 | 89,235.24 | 246,582.30 |
| Shops, Engine Houses and Turn Tables | 921.07 | 316,971.01 | 191,902.16 | 509,794.24 |
| Shop Machinery and Tools | | 182,450.64 | 45,549.39 | 228,000.03 |
| Water Stations | 22,972.88 | 5,906.99 | 83,527.90 | 112,407.77 |
| Fuel Stations | 1,358.60 | Cr. 289.83 | 16,381.94 | 17,450.71 |
| Grain Elevators | 113.98 | ..... |  | 113.98 |
| Storage Warehouses | | 568.41 | ..... | 568.41 |
| Dock and Wharf Property | | 2,552.88 | ..... | 2,552.88 |
| Miscellaneous Structures | 7,135.53 | Cr. 2,907.95 | 12,318.95 | 15,546.53 |
| Transportation of Men and Material | 22,793.13 | ..... | ..... | 22,793.13 |
| Rent of Equipment | 20,934.60 | ..... | ..... | 20,934.60 |
| Repairs of Equipment | 10,833.77 | ..... | ..... | 10,833.77 |
| Injuries to Persons | 1,496.54 | ..... | 6,227.73 | 7,724.27 |
| Total | \$4,102,584.15 | \$4,540,799.87 | \$2,501,398.15 | \$11,144,782.17 |
| II.—EQUIPMENT. | | | | |
| Steam Locomotives | ..... | ..... | \$1,680,140.79 | \$1,680,140.79 |
| Passenger Train Cars | ..... | \$790,868.89 | 86,378.54 | 877,247.43 |
| Freight Train Cars | ..... | 1,247,982.61 | 502,007.27 | 1,749,989.85 |
| Work Equipment | \$1,020.62 | 317,443.08 | 26,308.82 | 344,772.52 |
| Total | \$1,020.62 | \$2,356,294.58 | \$2,294,835.42 | \$4,652,150.62 |
| III.—GENERAL EXPENDITURES. | | | | |
| Law Expenses | \$1.25 | ..... | ..... | \$1.25 |
| Taxes | 36.62 | ..... | ..... | 36.62 |
| Other Expenditures | 30,619.33 | \$105.89 | \$30,521.44 | 61,246.66 |
| Total | \$30,657.20 | \$105.89 | \$30,521.44 | \$61,284.53 |
| Grand Total | \$4,134,261.97 | \$6,897,200.34 | \$4,826,755.01 | \$15,858,217.32 |

MILEAGE STATISTICS.

| ITEM. | 1911. Miles. | 1910. Miles. | Increase or Decrease. Miles. |
|---|-----------------|-----------------|------------------------------------|
| LOCOMOTIVE MILEAGE—Revenue Service. | | | |
| Freight Locomotive Miles | 18,339,226 | 20,664,263 | Dec. 2,325,037 |
| Passenger Locomotive Miles | 17,703,619 | 17,882,270 | Dec. 178,651 |
| Mixed Locomotive Miles | 909,707 | 912,212 | Dec. 2,505 |
| Special Locomotive Miles | 11,436 | 14,372 | Dec. 2,936 |
| Switching Locomotive Miles | 9,260,623 | 9,858,473 | Dec. 597,850 |
| Total | 46,224,611 | 49,331,590 | Dec. 3,106,979 |
| Locomotive Mileage—Non-revenue Service | | | |
| 1,854,949 | 2,379,048 | Dec. | 524,099 |
| CAR MILEAGE—Revenue Service. | | | |
| Freight Car Mileage: | | | |
| Loaded | 413,501,696 | 437,559,610 | Dec. 24,057,914 |
| Empty | 177,727,113 | 180,914,529 | Dec. 3,187,416 |
| Caboose | 16,649,388 | 18,518,939 | Dec. 1,869,551 |
| Total | 607,878,197 | 636,993,078 | Dec. 29,114,881 |
| Passenger Car Mileage: | | | |
| Passenger | 46,429,369 | 46,949,693 | Dec. 520,324 |
| Sleeping, Parlor and Observation | 25,902,599 | 25,683,230 | Inc. 219,369 |
| Other Passenger Train Cars | 39,689,610 | 37,103,965 | Inc. 2,585,645 |
| Total | 112,021,578 | 109,736,888 | Inc. 2,284,690 |

| Car Mileage in Special Service: | | | | |
|---------------------------------------|-------------|-------------|------|------------|
| Freight Loaded | 132,703 | 157,000 | Dec. | 24,297 |
| Caboose | 10,902 | 13,443 | Dec. | 2,541 |
| Passenger | 38,797 | 49,119 | Dec. | 10,322 |
| Sleeping, Parlor and Observation | ..... | 653 | Dec. | 653 |
| Other Passenger Train Cars | ..... | 2,571 | Dec. | 2,571 |
| Total | 182,402 | 222,786 | Dec. | 40,384 |
| Total Car Mileage—Revenue Service | 720,082,177 | 746,952,752 | Dec. | 26,870,575 |
| Car Mileage—Non-revenue Service | 10,885,312 | 17,209,298 | Dec. | 6,323,986 |
| TRAIN MILEAGE—Revenue Service. | | | | |
| Freight Train | 16,608,998 | 18,595,294 | Dec. | 1,986,296 |
| Passenger Train | 17,303,893 | 17,336,810 | Dec. | 32,917 |
| Mixed Train | 903,712 | 906,073 | Dec. | 2,361 |
| Special Train | 10,902 | 12,907 | Dec. | 2,005 |
| Total Train Mileage—Revenue Service | 34,827,505 | 36,851,084 | Dec. | 2,023,579 |
| Train Mileage—Non-revenue Service | 1,289,761 | 1,788,271 | Dec. | 498,510 |

GENERAL BALANCE SHEET.

June 30, 1911.

ASSETS.

| | |
|--|------------------|
| Property Investment—Road and Equipment: | |
| Road | \$330,972,434.23 |
| Equipment | 58,025,703.79 |
| General Expenditures | 1,515,827.90 |
| Reserve for Accrued Depreciation—Credit..... | 14,006,026.45 |
| Total | \$376,507,939.47 |
| Securities: | |
| Securities of Proprietary, Affiliated and Controlled Companies, Pledged— | |
| Stocks | 19,344,014.38 |
| Securities Issued or Assumed, Pledged— | |
| Funded Debt | 31,000.00 |
| Securities of Proprietary, Affiliated and Controlled Companies, Unpledged— | |
| Stocks | \$7,534,861.63 |
| Funded Debt | 704,050.00 |
| Total | 8,238,911.63 |
| Other Investments: | |
| Advances to Proprietary, Affiliated and Controlled Companies for Construction, Equipment and Betterments | 402,109.77 |
| Miscellaneous Investments— | |
| Physical Property | \$1,472,338.25 |
| Securities Unpledged | 1,295,285.83 |
| Total | 2,767,624.08 |
| Working Assets: | |
| Cash | 10,652,950.22 |
| Securities Issued or Assumed, Held in Treasury— | |
| Funded Debt | 9,318,200.00 |
| Marketable Securities— | |
| Stocks | \$757,572.12 |
| Funded Debt | 70,900.00 |
| Loans and Bills Receivable | 828,472.12 |
| Traffic and Car Service Balances due from other Companies | 2,623,087.11 |
| Net Balance Due from Agents and Conductors..... | 748,879.37 |
| Miscellaneous Accounts Receivable..... | 1,954,992.84 |
| Materials and Supplies | 4,133,140.38 |
| Other Working Assets | 7,812,557.87 |
| Total | 37,343.55 |
| Deferred Debit Items— | |
| Advances— | |
| Temporary Advances to Proprietary, Affiliated and Controlled Companies | \$491,965.77 |
| Working Funds | 196,850.16 |
| Other Advances | 27,125.81 |
| Insurance Paid in Advance..... | 715,941.74 |
| Cash and Securities in Sinking Funds..... | 145,599.63 |
| Securities in Provident Funds | 17,246,688.61 |
| Unextinguished Discount on Funded Debt..... | 496,538.89 |
| Other Deferred Debit Items..... | 318,013.20 |
| Total | 1,180,186.74 |
| Grand Total | \$20,102,968.81 |

Grand Total

\$465,504,191.60

LIABILITIES.

| | |
|---|------------------|
| Capital Stock: | |
| Common Stock | \$110,839,100.00 |
| Mortgage, Bonded and Secured Debt: | |
| Funded Debt— | |
| Mortgage Bonds— | |
| Held by Company..... | \$9,241,000.00 |
| Not held by Company..... | 181,080,800.00 |
| Collateral Trust Bonds— | |
| Held by Company | 56,200.00 |
| Not held by Company | 7,254,000.00 |
| Plain Bonds— | |
| Held by Company..... | 52,000.00 |
| Not held by Company..... | 12,125,000.00 |
| Total | \$209,809,000.00 |
| Working Liabilities— | |
| Traffic and Car-service Balances due to other Companies. | 1,285,230.76 |
| Audited Vouchers and Wages Unpaid..... | 6,599,261.05 |
| Miscellaneous Accounts Payable..... | 468,798.22 |
| Matured Interest and Dividends Unpaid..... | 2,150,140.00 |
| Matured Mortgage, Bonded and Secured Debt Unpaid.. | 59,000.00 |
| Other Working Liabilities | 62,317.06 |
| Total | \$10,624,747.09 |
| Accrued Liabilities not Due— | |
| Unmatured Interest and Sinking Fund Payments..... | 1,483,594.13 |
| Taxes Accrued | 68,400.00 |
| Total | \$1,551,994.13 |
| Deferred Credit Items— | |
| Operating Reserves | 1,510,448.16 |
| Liability on Account of Provident Funds..... | 496,538.89 |
| Other Deferred Credit Items..... | 202,079.07 |
| Total | \$2,209,066.12 |
| Appropriated Surplus— | |
| Additions to Property since June 30, 1907, through Income | 13,579,256.95 |
| Reserves from Income or Surplus— | |
| Invested in Sinking Funds | 29,732,509.37 |
| Total | \$43,331,766.32 |
| Profit and Loss— | |
| Income Account | 44,935,252.97 |
| Profit and Loss | 42,203,264.97 |
| Total | \$87,138,517.94 |
| Grand Total | \$465,504,191.60 |

INCOME ACCOUNT.

OPERATING INCOME.

RAIL OPERATIONS—

Operating Revenues:

Revenue from Transportation:

| | |
|------------------------------|-----------------|
| Freight | \$58,033,242.91 |
| Passenger | 22,552,567.22 |
| Excess Baggage | 321,851.89 |
| Mail | 2,375,713.68 |
| Express | 2,493,252.45 |
| Milk | 359,115.48 |
| Other Passenger Train.... | 10,270.45 |
| Switching | 1,090,068.46 |
| Special Service Train..... | 26,429.71 |
| Miscellaneous Transportation | 72,092.62 |
| | \$87,334,604.87 |

Revenue from Operations other than Transportation:

| | |
|--|-----------------|
| Station and Train Privileges | \$7,976.56 |
| Parcel Room Receipts..... | 7,768.78 |
| Storage Freight | 45,410.15 |
| Storage Baggage | 18,657.99 |
| Car Service | 277,609.88 |
| Telegraph and Telephone Service | 203,950.75 |
| Rent of Buildings and other Property | 110,166.59 |
| Miscellaneous | 160,816.62 |
| Joint Facilities Dr..... | 832,357.32 |
| Joint Facilities Cr..... | 19,412.59 |
| Total Operating Revenues..... | 124,658.67 |
| | \$88,272,208.27 |

| | | |
|---|-----------------|---|
| Operating Expenses: | | Interest on other Securities, Loans and Ac- |
| Maintenance of Way and | | counts |
| Structures \$12,406,278.81 | | 167,429.09 2,174,698.87 |
| Maintenance of Equipment. 14,761,137.51 | | |
| Traffic Expenses 1,581,805.25 | | Gross Corporate Income..... \$27,748,768.18 |
| Transportation Expenses.... 28,543,204.54 | | |
| General Expenses 2,249,499.55 59,541,925.66 | | |
| Net Operating Revenue..... | \$28,730,282.61 | |
| OUTSIDE OPERATIONS: | | DEDUCTIONS FROM GROSS CORPORATE INCOME. |
| Revenue \$721,539.60 | | Other Rents—Debits: |
| Expenses 828,628.73 | | Hire of Equipment—Balance \$663,942.50 |
| Net Deficit from Outside Operations..... 107,089.13 | | Joint Facilities 902,894.52 |
| Total Net Revenue..... \$28,623,193.48 | | Miscellaneous Rents 43,799.52 \$1,610,636.54 |
| Taxes Accrued 3,049,124.17 | | Interest Accrued on Funded Debt..... 8,626,369.54 |
| Operating Income \$25,574,069.31 | | Other Interest 3,702.07 |
| OTHER INCOME. | | Sinking Funds Chargeable to Income..... 662,310.50 |
| Rents Accrued from Lease of Roads..... \$2,910.24 | | Extinguishment of Discount on Securities.... 1,986.80 10,905,005.45 |
| Other Rents—Credits: | | Net Corporate Income..... \$16,843,762.73 |
| Joint Facilities \$567,420.65 | | |
| Miscellaneous Rents 106,148.53 | | DISPOSITION OF NET CORPORATE INCOME. |
| Dividends Received on Stocks Owned or Con- | | Dividends Declared on Stock: |
| trolled | 673,569.18 | 2 per cent., payable October |
| Interest Received on Funded Debt Owned or | 766,164.50 | 1, 1910 \$2,216,782.00 |
| Controlled | 564,625.86 | 2 per cent., payable January |
| | | 1, 1911 2,216,782.00 |
| | | 2 per cent., payable April 1, |
| | | 1911 2,216,782.00 |
| | | 2 per cent., payable June 26, |
| | | 1911 2,216,782.00 \$8,867,128.00 |
| | | Appropriations for Betterments: |
| | | Expended during the year..... 4,826,755.01 13,693,883.01 |
| | | Surplus for the year..... \$3,149,879.72 |

THE CHESAPEAKE AND OHIO RAILWAY COMPANY THIRTY-THIRD ANNUAL REPORT.

RICHMOND, Va., September 28, 1911.

TO THE STOCKHOLDERS:

The Thirty-third Annual Report of the Board of Directors, for the fiscal year ended June 30, 1911, is herewith submitted. The average mileage operated during the year was 1,944.6 miles, an increase over the previous year of 7.7 miles; including the mileage of The Chesapeake and Ohio Railway Company of Indiana (the Chicago Line referred to more fully in your last annual report), the average mileage operated during the year was 2,229.2 miles, an increase over the previous year of 292.3 miles. The mileage at the end of the year was 1,957.2 miles, an increase as compared with June 30, 1910, of 18.4 miles; including the Chicago Line, 2,241.6 miles, an increase of 302.8 miles. See schedule on page 12.

The operations of the Chicago Line are included in this report. Its operations were restricted by reason of the lack of facilities, which are being gradually improved. In addition to the considerable traffic tributary locally to the line, there is sufficient additional traffic to insure its profitable operation to be delivered to it by the parent company as soon as adequate facilities are provided. To give stockholders an opportunity to compare the results achieved in operation during the year, there will be found in the appendix to this report separate tables of traffic statistics for the Chesapeake & Ohio Railway, the Chicago Line, and both lines combined.

RESULTS FOR THE YEAR.

| | |
|--|-----------------|
| Operating Revenues were..... | \$32,583,411.24 |
| (Increase \$1,346,241.94, or 4.31%). | |
| Operating Expenses were..... | 21,793,615.02 |
| (Increase \$2,856,916.00, or 15.09%). | |
| Net Operating Revenue was..... | \$10,789,796.22 |
| (Decrease \$1,510,674.06, or 12.28%). | |
| Taxes were 1,065,853.13 | |
| (Increase \$192,109.01, or 21.99%). | |
| Operating Income, Taxes deducted, was..... | \$9,723,943.09 |
| (Decrease \$1,702,783.07, or 14.90%). | |
| Miscellaneous Income was..... | 1,560,814.73 |
| (Increase \$399,449.51, or 34.39%). | |
| Rentals and Other Payments were..... | \$11,284,757.82 |
| (Increase \$439,471.36, or 60.41%). | |
| Income for the year available for interest was..... | \$10,117,832.48 |
| (Decrease \$1,742,804.92, or 14.69%). | |
| Interest (68.0% of amount available) amounted to..... | 6,889,547.65 |
| (Increase \$1,319,396.55, or 23.69%). | |
| Net Income for the year, equivalent to 5.14% on capital stock outstanding, amounted to | \$3,228,284.83 |
| (Decrease \$3,062,201.47, or 48.68%). | |
| Dividends paid during the year: Four dividends of 1 1/4 each, aggregating | 3,139,625.00 |
| (Increase \$471,007.50, or 17.65%). | |
| Remainder | 88,659.83 |

FINANCIAL.

The outstanding capital stock was reduced during the year through the conversion of \$3,400 par value of First Preferred Stock and \$500 par value of Second Preferred Stock into Common Stock and General Mortgage 4 1/2 per cent. Bonds. The changes in secured debt shown on the balance sheet on June 30, 1911, as compared with June 30, 1910, are as follows:

| | Increase. | Decrease. |
|---|-----------------|----------------|
| 5 per cent. Consolidated Mortgage Bonds.... | \$2,000,000.00 | ..... |
| 4 1/2 per cent. General Mortgage Bonds..... | 2,600,000.00 | ..... |
| 6 per cent. Peninsula Division Mortgage Bonds | ..... | \$2,000,000.00 |
| 5 per cent. First Mortgage Greenbrier & New River Bonds ..... | ..... | 339,000.00 |
| 4 per cent. First Mortgage Greenbrier Railway Bonds | ..... | 20,000.00 |
| 4 per cent. First Mortgage Big Sandy Railway Bonds | ..... | 53,000.00 |
| 4 per cent. First Mortgage Coal River Railway Bonds ..... | ..... | 29,000.00 |
| 4 1/2 per cent. Secured Gold Notes..... | 16,000,000.00 | ..... |
| Equipment Trust Obligations..... | ..... | 2,054,000.00 |
| Equipment Trust Obligations (The Chesapeake and Ohio Ry Co. of Ind.)..... | 176,370.59 | ..... |
| Total | \$20,776,370.59 | \$4,495,000.00 |
| Net increase | 16,281,370.59 | |

The 5 per cent. First Consolidated Mortgage Bonds were issued and sold to retire the 6 per cent. Peninsula Division Bonds; the 4 1/2 per cent. General Mortgage Bonds were issued for the building of additional double track and to retire the Greenbrier and New River Railroad Company First Mortgage 5 per cent. Bonds and in exchange for preferred stock.

The secured notes above mentioned were sold to bankers on May 15, 1911, and draw interest semi-annually from June 1, 1911, to June 1, 1914, the date of maturity, but are redeemable on any interest day upon sixty days prior notice of publication. The funds realized from this sale were used to reimburse your Company's treasury for capital expenditures theretofore made, to meet obligations incurred for similar purposes, and will be applied in like manner throughout the calendar year. At your special meeting held at Richmond April 29, 1911, your Company was authorized to issue not to exceed \$125,000,000 First Lien and Improvement Mortgage Bonds, maturing December 1, 1930, bearing interest not exceeding 5 per cent. per annum. None of these bonds have been issued.

Your Company has acquired during the year additional shares of stock of The Hocking Valley Railway Company and of White Sulphur Springs, Incorporated. It has also acquired all of the stock of the Kanawha Bridge and Terminal Company, which owns a bridge across the Kanawha River at Charleston, West Virginia, and certain terminal properties, the bridge being a connecting link between the lines of your Company and those of The Kanawha and Michigan Railway Company. \$60,000 par amount of First Mortgage 4 per cent. Bonds of Coal River Railway Company and \$100,000 par amount of First Mortgage 4 per cent. Bonds of Raleigh and Southwestern Railway Company, which were in your Company's treasury, were exchanged for \$400,000 par amount of this stock.

An analysis of property accounts will be found on page 16, by reference to which it will be seen that additions and betterments were made to the amount of \$6,218,565.36, of which \$6,133,690.37 was added to cost of road and \$84,874.99 was added to equipment account during the year. A schedule of securities owned June 30, 1911, will be found on pages 17 and 18.

During the past two years your Company's expansion of capital and its principal expenditures for acquisitions and improvements have been as follows:

| CAPITAL OBLIGATIONS ISSUED OR ASSUMED: | |
|---|------------------------|
| General Mortgage 4½% Bonds..... | \$3,342,000.00 |
| First Consolidated Mortgage 5% Bonds..... | 2,000,000.00 |
| Convertible 4½% Debentures..... | 31,390,000.00 |
| Three Year 4½% Collateral Trust Notes..... | 16,000,000.00 |
| Coal River Railway Co. First Mortgage 4% Bonds..... | 2,450,000.00 |
| Raleigh and Southwestern Railway Co. First Mortgage 4% Bonds..... | 750,000.00 |
| Paint Creek Branch First Mortgage 4% Bonds..... | 14,000.00 |
| | \$55,946,000.00 |

Realizing \$52,604,610.00

Less:
CAPITAL OBLIGATIONS PAID:

| | |
|--|-----------------------|
| Peninsula Division Bonds maturing January 1, 1911 | \$2,000,000.00 |
| Greenbrier and New River Bonds redeemed February 1, 1911 | 339,000.00 |
| Equipment Trust Payments..... | 4,086,000.00 |
| Through Sinking Funds: | |
| Greenbrier Railway Co. First Mortgage 4% Bonds | 39,000.00 |
| Coal River Railway Co. First Mortgage 4% Bonds | 29,000.00 |
| Big Sandy Railway Co. First Mortgage 4% Bonds | 105,000.00 |
| | \$6,598,000.00 |

Costing 6,580,388.75
\$46,024,221.25

ACQUISITIONS:

| | |
|--|------------------------|
| Stocks of: | |
| The C. & O. Railway Co. of Indiana..... | \$4,998,800.00 |
| The Hocking Valley Railway Co..... | 7,671,800.00 |
| The Kanawha & Michigan Railway Co..... | 4,027,100.00 |
| Kanawha Bridge and Terminal Co..... | 400,000.00 |
| The Levisa River R. R. Co. (of Va.)..... | 50,000.00 |
| Levisa River R. R. Co. (of Ky.)..... | 50,000.00 |
| White Sulphur Springs, Incorporated..... | 477,600.00 |
| | \$17,675,300.00 |

| | |
|---|------------------------|
| Costing Bonds of: | \$17,835,834.39 |
| The C. & O. Railway Co. of Indiana First Mortgage..... | \$5,279,000.00 |
| The C. & O. Railway Co. General Funding and Improvement Mortgage..... | 6,787,000.00 |
| Paint Creek Branch First Mortgage..... | 14,000.00 |
| Raleigh and Southwestern Railway Co. First Mortgage..... | 186,000.00 |
| Coal River Railway Co. First Mortgage..... | 140,000.00 |
| | \$12,406,000.00 |

| | |
|---|---------------------|
| Costing Properties of: | \$17,835,834.39 |
| Coal River Railway Company..... | \$2,304,359.88 |
| Raleigh and Southwestern Railway Company..... | 816,562.42 |
| | 3,120,922.30 |

| | |
|---|-----------------------|
| Costing Additions and Betterments, The C. & O. Ry Co., costing | \$8,965,062.95 |
| Additions and Betterments, The C. & O. Ry Co., of Indiana, in addition to those for which bonds have been acquired, costing.... | 149,489.83 |
| | 9,114,552.78 |
| | \$2,051,744.98 |

Costing 7,260,000.00 9,311,744.98

\$51,171,656.54

In connection with the expenditures for additions and betterments, attention is called to the following increases during the period in the facilities of your Company to care for increased traffic and in its gross earnings and service to the public:

| | 1911. | 1909. | Increase. |
|---|-----------------|-----------------|----------------|
| Average miles operated | 2,229.2 | 1,896.6 | 332.6 |
| Second track mileage | 420.4 | 304.2 | 116.2 |
| Operating revenues | \$32,583,411.24 | \$26,630,717.78 | \$5,952,693.46 |
| Locomotives in service | 780 | 672 | 108 |
| Passenger train cars in service | 342 | 306 | 36 |
| Freight train and miscellaneous cars in service | 42,868 | 35,198 | 7,670 |
| Number of tons of freight carried one mile | 6,082,682,596 | 5,095,552,874 | 987,129,722 |
| Number of passengers carried one mile | 253,262,253 | 217,694,041 | 35,568,212 |

GENERAL REMARKS.

| | | | |
|--|--------------------|--------------------|---|
| The equipment inventory as of June 30, 1911, was as follows: | C. & O. R'y Co. | C. & O. R'y Co. | Increase of I. Lines during year. |
| Locomotives owned | 475 | 30 | 505 19 |
| Locomotives leased under equipment trusts | 250 | 25 | 275 62 |
| Total | 725 | 55 | 780 81 |
| Passenger cars owned | 309 | 23 | 332 26 |
| Passenger train cars leased under equipment trusts | 10 | | 10 10 |
| Total | 319 | 23 | 342 36 |
| Freight train and miscellaneous cars owned | 18,113 | 285 | 18,398 133 |

Freight train cars leased under equipment trusts 23,805 665 24,470 4,275

Total 41,918 950 42,868 4,408

The changes during the year in the reserve for accrued depreciation of equipment are as follows:

Balance to credit of account June 30, 1910

Amount credited during year ended June 30, 1911, by charges to—

Operating expenses \$684,193.05

Outside operations expenses 16,407.51

\$700,600.56

Charges to account for:

Accrued depreciation on equipment retired during year—

16 locomotives, 443 freight and work cars \$20,731.66

Accrued depreciation on cars changed in class during year

1,560.16

\$22,291.82

Less:

Adjustment account of cars replaced in service

414.64

21,877.18

678,723.38

Balance to credit of account June 30, 1911

\$2,075,866.17

Extensions of 14.6 miles on Raleigh and Southwestern Railway, 11.2 miles on Coal River branch lines, 12.4 miles on Guyandotte Valley branch, and 11.5 miles on Buffalo Creek branch, are nearing completion. These extensions, some of which were referred to in the last annual report, are for the purpose of further development of timber and coal tonnage and will be in operation within a few months.

Second track referred to in last Annual Report as under construction was completed, as follows:

| | | |
|-----------------------------------|------------------------|-------------------|
| Walker to Elko..... | Richmond Division | 15.8 miles |
| Korah to Westham | Richmond Division | 3.0 miles |
| Gladstone to Riverville | Clifton Forge Division | 3.0 miles |
| Fort Spring to Rockland | Hinton Division | 2.1 miles |
| Riverton to South Portsmouth..... | Cincinnati Division | 19.0 miles |
| Quick's Run to Robtown..... | Cincinnati Division | 13.5 miles |
| Manchester to Crooked Creek..... | Cincinnati Division | 3.3 miles |
| Carntown to Brent | Cincinnati Division | 19.9 miles |
| | | 79.6 miles |

Of the 67 miles of second track on the Cincinnati Division authorized in 1910, 12 miles were incomplete at the end of the fiscal year. Your Directors authorized the construction of 48 additional miles to make the double track on the Division complete, and the work is in active progress. It is expected that these uncompleted 60 miles will be in operation by December 31, 1911, as 30 miles have been finished since the close of the fiscal year.

The coal and coke tonnage of The Chesapeake and Ohio Railway Company, not including the Chesapeake and Ohio Railway of Indiana, was 15,725,031, an increase of 1.1 per cent.; other freight tonnage was 7,632,862, an increase of 4 per cent. The total tonnage was 23,357,893 tons, an increase of 2 per cent. Freight train mileage was 8,563,553 miles, a decrease of 2 per cent. Freight revenue was \$24,395,288.09, a decrease of \$505,911.68, or 2 per cent. The revenue ton miles were 5,852,506,320, a decrease of 4.4 per cent. The ton mile revenue was 4.17 mills, an increase of 2.5 per cent. Revenue per freight train mile was \$2,849, same as last year. The revenue tonnage per train mile was 683 tons, a decrease of 2.6 per cent.; including Company's freight, the tonnage per train mile was 717 tons, a decrease of 2.2 per cent. The tonnage per locomotive, including Company's freight, was 648 tons, an increase of 1.3 per cent. The average revenue tonnage per loaded car was 29.6 tons, a decrease of 3.3 per cent. The number of tons of revenue freight carried one mile per mile of road was 3,009,620, a decrease of 4.8 per cent.

There were 5,272,931 passengers carried by The Chesapeake and Ohio Railway Company, not including the Chesapeake and Ohio Railway of Indiana, an increase of 6.1 per cent. The number carried one mile was 237,239,519, an increase of 4.6 per cent. Passenger revenue was \$5,255,364.82, an increase of 5.1 per cent. Revenue per passenger per mile was 2.215 cents, an increase of 0.4 per cent. Number of passengers carried one mile per mile of road was 121,999, an increase of 4.2 per cent. Passenger train mileage was 4,430,362, an increase of 3.6 per cent. Passenger revenue per train mile was \$1,186, an increase of 1.4 per cent.; including mail and express it was \$1,379, an increase of 1.5 per cent.; passenger service train revenue per train mile was \$1,418, an increase of 0.9 per cent.

There were 20,110 tons of new rails (6,194 tons 100-lb. and 13,916 tons 85 and 90-lb.), equal to 140 track miles, used in the renewal of existing main tracks.

At the close of the fiscal year first and second main tracks of both lines (not including trackage rights), were laid with steel rails, as follows:

| | | | |
|----------------------------------|---------------------|------|--------------------|
| 100-lb | 769.5 miles | Inc. | 82.6 miles |
| 90-lb | 181.9 miles | Inc. | 88.8 miles |
| 85-lb | 537.4 miles | Inc. | 50.7 miles |
| 80-75-70-lb | 762.2 miles | Inc. | 162.9 miles |
| 62-56-50-lb (Branch Lines) | 186.8 miles | Dec. | 26.3 miles |
| | 2437.8 miles | Inc. | 358.7 miles |

Track ballasted with stone or its equivalent, June 30, 1911, on both lines

Ballast (principally stone) used in maintenance during year, on both lines

Ballast used in construction work during year, on both lines

Ties used in maintenance during year, on both lines

Ties used in construction work during year, on both lines

The average amount expended for repairs per locomotive operated by The Chesapeake and Ohio Railway Company was \$2,394.79; per passenger train car \$822.66; per freight train car \$62.46.

January 1, 1911, Mr. C. C. Walker was promoted to position of Assistant General Manager; Mr. E. P. Goodwin to General Superintendent Transportation; Mr. J. R. Cary to General Superintendent West Virginia General Division; and Mr. J. B. Harris and Mr. H. H. Morris to Superintendents of Hinton and Huntington Divisions, respectively.

Appreciative acknowledgment is hereby made of efficient services during the year of officers and employees.

By order of the Board of Directors.

FRANK TRUMBULL,
Chairman.

GEO. W. STEVENS,
President.

THE CHESAPEAKE AND OHIO RAILWAY COMPANY.
(Not Including The Chesapeake and Ohio R'y of Indiana.)

TRAFFIC STATISTICS.

TABLE 11.

| FREIGHT. | | | COMPARISON WITH JUNE 30, 1910. | |
|---|---------------------------|---------------------------|--------------------------------|------------------|
| | YEAR ENDED JUNE 30, 1911. | YEAR ENDED JUNE 30, 1910. | INCREASE OR DECREASE. | PER CENT. |
| Average mileage operated | 1,944.6 | 1,936.9 | I. | 7.7 0.4 |
| Freight revenue | \$24,395,288.09 | \$24,901,199.77 | D. | \$505,911.68 2.0 |
| Per cent. of gross revenue | 78.6 | 79.7 | D. | 1.1 1.4 |
| Revenue coal and coke carried (tons) | 15,725,031 | 15,549,977 | I. | 175,054 1.1 |
| Other revenue freight carried (tons) | 7,632,862 | 7,342,252 | I. | 290,610 4.0 |
| Number of revenue tons carried, total | 23,357,893 | 22,892,229 | I. | 465,664 2.0 |
| Number of revenue tons carried one mile..... | 5,852,506,320 | 6,123,134,875 | D. | 270,628,555 4.4 |
| Average miles each revenue ton was carried.. | 251 | 267 | D. | 16 6.0 |
| Number of revenue tons carried per mile of road | 12,012 | 11,819 | I. | 193 1.6 |
| Number of revenue tons carried one mile per mile of road..... | 3,009,620 | 3,161,307 | D. | 151,687 4.8 |
| Freight revenue per mile of road | \$12,545.14 | \$12,856.21 | D. | \$311.07 2.4 |
| Average revenue per revenue ton | \$1.044 | \$1.088 | D. | \$0.044 4.0 |
| Average revenue per ton of revenue coal per mile (mills) | 3.22 | 3.16 | I. | .06 1.9 |
| Average revenue per ton of revenue freight other than coal per mile (mills) | 6.49 | 6.50 | D. | .01 0.2 |
| Average revenue per ton per mile from all revenue freight (mills)... | 4.17 | 4.07 | I. | .10 2.5 |
| Average number of revenue tons per loaded car | 29.6 | 30.6 | D. | 1.0 3.3 |
| Average revenue train load (tons) | 683 | 701 | D. | 18 2.6 |
| Average train load, including Company's freight (tons)..... | 717 | 733 | D. | 16 2.2 |
| Average revenue tons per locomotive | 617 | 612 | I. | 5 0.8 |
| Average tons per locomotive, including Company's freight | 648 | 640 | I. | 8 1.3 |
| Average number of loaded cars per eastbound freight train | 24.4 | 25.2 | D. | .8 3.2 |
| Average number of empty cars per eastbound freight train | 13.8 | 11.9 | I. | 1.9 16.0 |
| Average number of loaded cars per westbound freight train..... | 21.8 | 20.6 | I. | 1.2 5.8 |
| Average number of empty cars per westbound freight train..... | 14.7 | 16.4 | D. | 1.7 10.4 |
| Average number of loaded cars in train | 23.1 | 22.9 | I. | .2 0.9 |
| Average number of empty cars in train..... | 14.2 | 14.1 | I. | .1 0.8 |
| Total cars per freight train | 37.3 | 37.0 | I. | .3 0.8 |
| *Miles run by freight trains | 8,563,553 | 8,739,022 | D. | 175,469 2.0 |
| Miles run by switch and construction trains ... | 5,084,513 | 5,096,767 | D. | 12,254 0.2 |
| Freight car mileage..... | 319,821,733 | 323,680,065 | D. | 3,858,332 1.2 |
| Loaded car mileage..... | 197,712,973 | 200,270,768 | D. | 2,557,795 1.3 |
| Empty car mileage..... | 122,108,760 | 123,409,297 | D. | 1,300,537 1.1 |
| Freight train mileage per mile of road..... | 4,404 | 4,512 | D. | 108 2.4 |
| Freight revenue per freight train mile..... | \$2,849 | \$2,849 | | |

*Includes mileage made by light trains.

| PASSENGER. | | | COMPARISON WITH JUNE 30, 1910. | |
|---|---------------------------|---------------------------|--------------------------------|------------------|
| | YEAR ENDED JUNE 30, 1911. | YEAR ENDED JUNE 30, 1910. | INCREASE OR DECREASE. | PER CENT. |
| Average mileage operated | 1,944.6 | 1,936.9 | I. | 7.7 0.4 |
| Passenger revenue | \$5,255,364.82 | \$5,002,205.07 | I. | \$253,159.75 5.1 |
| Per cent. of gross revenue | 16.9 | 16.0 | I. | .9 5.6 |
| Passenger service train revenue | \$6,279,388.47 | \$6,008,818.79 | I. | \$270,569.68 4.5 |
| Number of passengers carried | 5,272,931 | 4,969,612 | I. | 303,319 6.1 |
| Number of passengers carried one mile..... | 237,239,519 | 226,715,956 | I. | 10,523,563 4.6 |
| Average miles each passenger was carried | 44.99 | 45.62 | D. | .63 1.4 |
| Number of passengers carried per mile of road.. | 2,712 | 2,566 | I. | 146 5.7 |

| PASSENGER. | | | COMPARISON WITH JUNE 30, 1910. | |
|---|---------------------------|---------------------------|--------------------------------|---------------|
| | YEAR ENDED JUNE 30, 1911. | YEAR ENDED JUNE 30, 1910. | INCREASE OR DECREASE. | PER CENT. |
| Number of passengers carried one mile per mile of road | 121,999 | 117,051 | I. | 4,948 4.2 |
| Passenger revenue per mile of road..... | \$2,702.54 | \$2,582.58 | I. | \$119.96 4.6 |
| Average revenue from each passenger | \$1.00 | \$1.01 | D. | .001 1.0 |
| Average revenue per passenger per mile (cents) | 2.215 | 2.206 | I. | .009 0.4 |
| Average number of passengers per train mile..... | 54 | 53 | I. | 1 1.9 |
| Passenger train mileage..... | 4,430,362 | 4,276,193 | I. | 154,169 3.6 |
| Passenger car mileage..... | 22,492,893 | 21,303,880 | I. | 1,189,013 5.6 |
| Passenger train mileage per mile of road..... | 2,278 | 2,207 | I. | 71 3.2 |
| Passenger revenue per train mile | \$1.186 | \$1.170 | I. | .016 1.4 |
| Revenue per passenger train mile, including mail and express..... | \$1.379 | \$1.359 | I. | .020 1.5 |
| Revenue per passenger service train mile..... | \$1.418 | \$1.405 | I. | .013 0.9 |

| FREIGHT. | | | CHESAPEAKE & OHIO R'Y OF INDIANA. | |
|---|---------------------------|---------------------------|-----------------------------------|---------------------------|
| | YEAR ENDED JUNE 30, 1911. | YEAR ENDED JUNE 30, 1911. | CHESAPEAKE & OHIO LINES. | YEAR ENDED JUNE 30, 1911. |
| Average mileage operated | 284.6 | 222.9 | | |
| Freight revenue | \$1,194,738.74 | \$25,590,026.83 | | |
| Per cent. of gross revenue | 77.9 | 78.5 | | |
| Revenue coal and coke carried (tons) | 372,919 | 16,097,950 | | |
| Other revenue freight carried (tons) | 873,836 | 8,506,700 | | |
| Number of revenue tons carried, total | 1,246,757 | 24,604,650 | | |
| Number of revenue tons carried one mile | 230,176,276 | 6,082,682,596 | | |
| Average miles each revenue ton was carried | 185 | 247 | | |
| Number of revenue tons carried per mile of road | 4,381 | 11,037 | | |
| Number of revenue tons carried one mile per mile of road | 808,771 | 2,728,625 | | |
| Freight revenue per mile of road..... | \$4,197.96 | \$11,476.46 | | |
| Average revenue per revenue ton | \$0.958 | \$1,040 | | |
| Average revenue per ton of revenue coal per mile (mills) | 3.49 | 3.22 | | |
| Average revenue per ton of revenue freight other than coal per mile (mills) | 5.96 | 6.45 | | |
| Average revenue per ton per mile from all revenue freight (mills) | 5.19 | 4.21 | | |
| Average number of revenue tons per loaded car | 21.9 | 29.2 | | |
| Average train load, including Company's freight (tons) | 325 | 656 | | |
| Average number of revenue tons per locomotive | 347 | 689 | | |
| Average tons per locomotive, including Company's freight | 289 | 592 | | |
| Average number of loaded cars per eastbound freight train | 309 | 621 | | |
| Average number of loaded cars per eastbound freight train | 13.2 | 23.5 | | |
| Average number of empty cars per eastbound freight train | 8.9 | 13.4 | | |
| Average number of loaded cars per westbound freight train | 16.5 | 21.4 | | |
| Average number of empty cars per westbound freight train | 5.1 | 14.0 | | |
| Average number of loaded cars in train | 14.8 | 22.5 | | |
| Average number of empty cars in train | 7.0 | 13.7 | | |
| Total cars per freight train | 21.8 | 36.2 | | |
| *Miles run by freight trains..... | 708,127 | 9,271,680 | | |
| Miles run by switch and construction trains | 284,623 | 5,369,136 | | |
| Freight car mileage | 15,466,533 | 335,288,264 | | |
| Loaded car mileage | 10,508,224 | 208,221,197 | | |
| Empty car mileage | 4,958,309 | 127,067,067 | | |
| Freight train mileage, per mile of road | 2,488 | 4,159 | | |
| Freight revenue per freight train mile | \$1,68.7 | \$2,76.0 | | |

*Includes mileage made by light trains.

| PASSENGER. | | | CHESAPEAKE & OHIO R'Y OF INDIANA. | |
|--|---------------------------|---------------------------|-----------------------------------|---------------------------|
| | YEAR ENDED JUNE 30, 1911. | YEAR ENDED JUNE 30, 1911. | CHESAPEAKE & OHIO LINES. | YEAR ENDED JUNE 30, 1911. |
| Average mileage operated | 284.6 | 222.9 | | |
| Passenger revenue | \$257,567.12 | \$5,512,931.94 | | |
| Per cent. of gross revenue | 16.8 | 16.9 | | |
| Passenger service train revenue | \$319,430.29 | \$6,598,818.76 | | |
| Number of passengers carried | 345,860 | 5,618,791 | | |
| Number of passengers carried one mile | 16,022,734 | 253,262,253 | | |
| Average miles each passenger was carried | 46.33 | 43.07 | | |
| Number of passengers carried per mile of road | 1,215 | 2,521 | | |
| Number of passengers carried one mile per mile of road | 56,299 | 113,611 | | |
| Passenger revenue per mile of road | \$905.01 | \$2,473.05 | | |
| Average revenue from each passenger | \$.74 | \$.98 | | |
| Average revenue per passenger per mile (cents) | 1,608 | 2,177 | | |
| Average number of passengers per train mile | 36 | 52 | | |
| Passenger train mileage | 446,783 | 4,877,145 | | |
| Passenger car mileage | 1,787,547 | 24,280,440 | | |
| Passenger train mileage per mile of road | 1,570 | 2,188 | | |
| Passenger revenue per train mile | \$.576 | \$ 1,130 | | |
| Revenue per passenger train mile, including mail and express | \$.700 | \$ 1,317 | | |
| Revenue per passenger service train mile | \$.715 | \$ 1,353 | | |